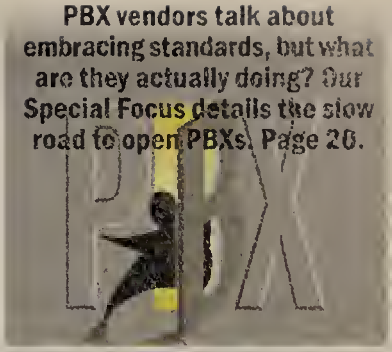
MAY 6, 1996 VOLUME 13, NUMBER 19

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING



PBX vendors talk about embracing standards, but what are they actually doing? Our Special Focus details the slow road to open PBXs. Page 20.

MFS buys $2b slice of the 'Net

Surprising UUNET acquisition could lead to more reliable Internet service offerings.

By Joanie Wexler and Tim Greene
Omaha, Neb.

The bar for Internet reliability was raised dramatically last week when competitive access provider MFS Communications Company, Inc. inked a $2 billion merger agreement with Internet service provider UUNET Technologies, Inc.

The combination of the UUNET and MFS networks will eventually enable the company to provide wide-ranging, end-to-end Internet services and offer service-level agreements, unheard of in today's rough-and-tumble Internet environment.

In fact, Alan Taffel, UUNET vice president of sales and marketing, said the company will offer guaranteed service levels to intranet customers — those creating secure, virtual private networks that use the Internet as the backbone — as early as next quarter.

Rick Weidinger, vice president of mergers for MFS, agreed that 'Net guarantees were one objective of the merged entity. "The quality of the Internet is now 'best effort,' whereas telephony standards are 'best quality,' " Weidinger said. "We're going to try to marry the two."

Users are supportive of such a union. "This bodes well for bringing stability to the 'Net," said Jim Fey, director of technology planning at PMI Mortgage

See **MFS**, *page 12*

OF INTERNET ACCESS AND HIGH-RELIABILITY FIBER NETS

MFS Communications	UUNET Technologies
Omaha, Neb.	*Fairfax, Va.*
1995 financials: Revenue of $498.2 million; loss from operations of $239.3 million	**1995 financials:** Revenue of $94.5 million; loss from operations of $18.3 million
Presence: Fiber network in 14 U.S. markets	**Presence:** Access in 300+ cities
Services: Business local access, long distance, LAN interconnection over ATM, network integration and management	**Services:** Internet business access, applications development and security, Web hosting

You call this competition?

Long-haul rates on the rise since signing of landmark law.

By David Rohde
Washington, D.C.

TELECOM IN TRANSITION

The Telecommunications Act of 1996 was meant to drive down network service costs by fostering competition, but you would never know it by looking at prices today.

Long-distance service rates, especially for bread-and-butter switched telephone offerings, have actually crept up since President Clinton signed the act in February.

The industry, it seems, is intent on harvesting one last cash-rich crop before multi-billion-dollar mergers forever change the competitive landscape.

"[The long-haul carriers'] perspective is: The RBOCs can't go immediately into long dis-

See **Rates**, *page 10*

Dial up more info on Network World Fusion, including:

- **A copy of an FCC proposal to eliminate long-distance tariffs**
- **An article on carrier frame relay pricing**
- **A reading list of books on network economics**

Select News+ then Front Page.

Network World Fusion
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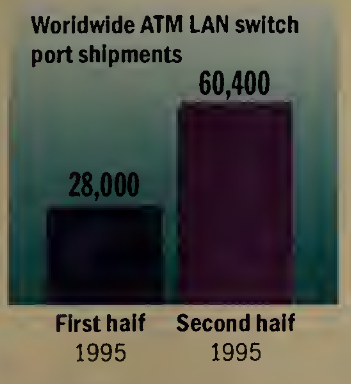
HP to break its ATM silence

ATM IN THE WORKGROUP

With ATM LAN backbone deployment on the rise, workgroup environments, in turn, are requiring ATM uplinks for connecting to these backbones.



SOURCE: DATAQUEST, SAN JOSE, CALIF.

By Jodi Cohen
Roseville, Calif.

Hewlett-Packard Co.'s hub unit has been mum about Asynchronous Transfer Mode to date, but the company will start pounding some drums with the announcement of ATM uplinks for its workgroup hubs and switches by year-end.

The company's initial ATM strategy will focus on linking customers' existing shared and switched Ethernet and 100M bit/sec networks into an ATM campus backbone or WAN, according to Brice Clark, strategic planning manager for HP's

See **ATM**, *page 65*

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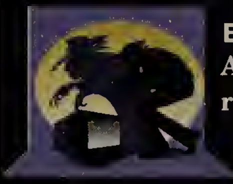
Access Network World Fusion using the number in yellow. See page 5 for details.

Special report

Shedding light on a 'darkside hacker'



By Chris Nerney

A magazine publisher says he has repeatedly invaded her computer system and tampered with her phones — a three-year campaign of harassment she estimates has cost her $1 million.

A systems administrator for an Internet service provider (ISP) in Massachusetts alleges he knocked out an entire server and posted anti-Semitic messages through the service.

Workers at the *Boston Herald* say he threatened to sabotage the newspaper's computer system after stories were printed about him.

His name is u4ea. He calls himself a "darkside hacker."

And no one knows his real identity.

He may be anonymous, but u4ea is not unique. There are hundreds, maybe thousands, of hackers easily capable of breaking into systems while eluding detection.

Though the vast majority of hackers, by most accounts, are guilty of no more than inquisitiveness and ingenuity, there are those whose motives are more sinister, whose actions wreak havoc on individuals and network systems.

These hackers roam cyberspace like latter-day pirates looking for vulnerable ports and defense-

See **Hacker**, *page 64*

Feds' crime crackdown leads to broader net monitoring

By Ellen Messmer
Washington, D.C.

If you spend any time on the Internet, or even on your own corporate intranet, what you type may be monitored by the U.S. government. And what they find can be used against you.

While law enforcement has long tapped circuit-switched phone lines, it would not commonly listen in on an entire community. But the Department of Justice is doing just that with special data-sniffing software.

See **Crime**, *page 65*

when it
comes to building
intranets...

cabletron is

Makes perfect sense when you think about it. After all, the Intranet is the Web server-based network within an organization that allows for seamless connectivity between multi-protocol, multi-vendor environments. Ushering in a whole new era of communication, the Intranet gives everyone quick access to voice, video, data and other resources they need to do a better job.

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SYNTHESIS

NETWORLD+INTEROP'96 Las Vegas-Nevada

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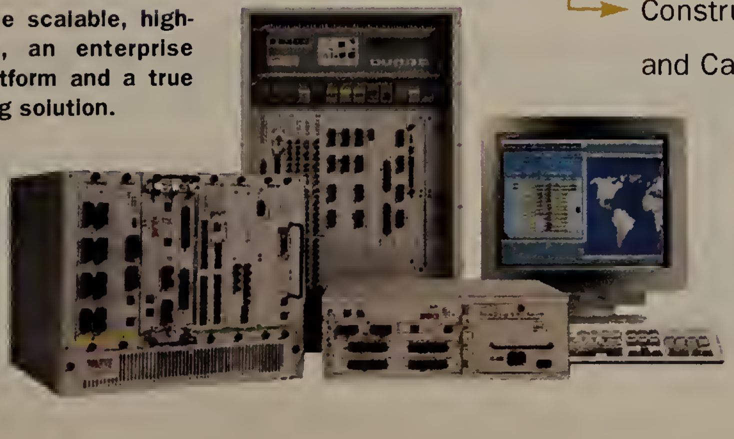
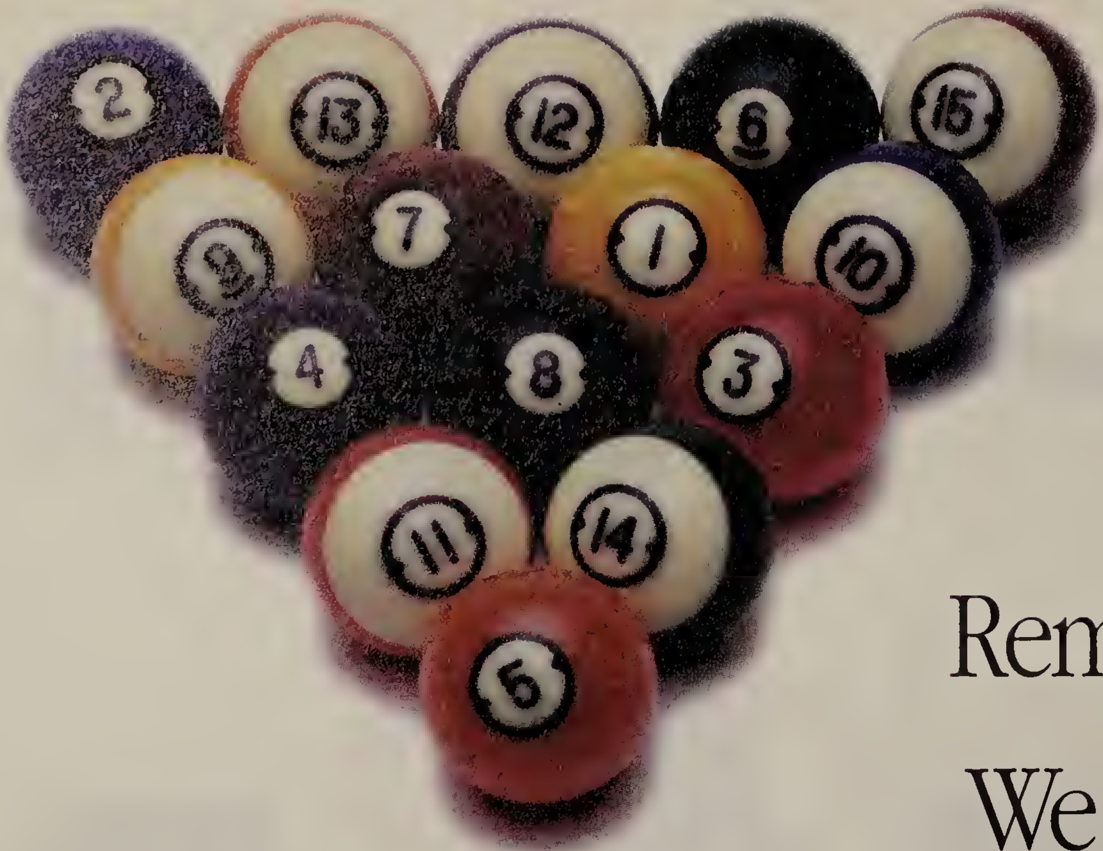
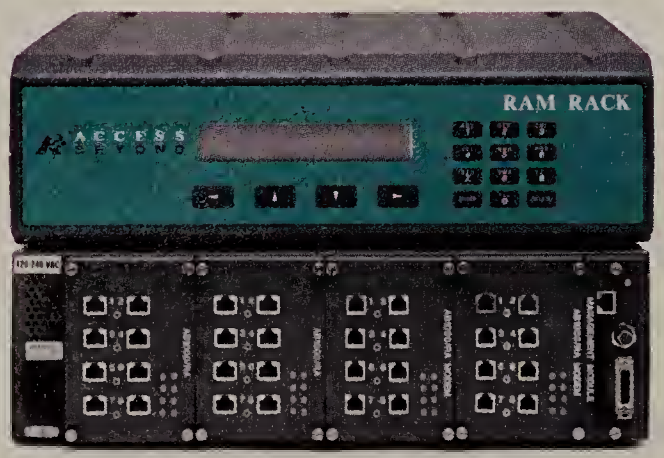




Before You Break The Bank On A Less Powerful Dial-In Remote Access Combination, We Offer Two Little Words…



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Presenting Penril's Remote Access Modem (RAM) Rack

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This Week

News+

The Front Page

- The Internet: Get financial information on new Internet player MFS and read recent articles on other Internet service providers.
- ATM switching: Check out articles on HP's efforts to upgrade its LAN offerings, even as it prepares to venture into ATM backbones.
- Computer crime: When does online crime fighting impinge on network users' rights to privacy? Take a look at our collection of articles and links, and decide for yourself.

The Technical Sections

- Enterprise faxing: Download our guide to cutting your fax costs, in WANs & Internetworking.
- Electronic commerce: Read up on the various encryption schemes being developed for online business applications and download Microsoft's ActiveX software developer's kit, in Intranets & the 'Net.
- Data mining: Dig deep into our collection of articles and links related to extracting useful nuggets of information from large enterprise databases, in Client/Server Applications.

Forum

- How secure is your network? And should you worry more about hackers on the outside or employees on the inside? We're starting an online conference this week to examine these and related topics. Pose your questions to our experts and join the debate. Select Forum then Hackers.

this week's pick

Mapping out your messaging future? Take a look at the Unofficial Extended MAPI Resources Page, which features plenty of links related to Microsoft Corp.'s Messaging API, which is quickly becoming the standard for connecting messaging clients and applications. You'll find it at http://www.wp.com/davidb/emapi.html.

HOW TO GET ON TO NETWORK WORLD FUSION

At the welcome screen, click on First Visit and follow the instructions. Subscribers, keep your NWF number – highlighted on the front cover's mailing label – handy during registration. Non-subscribers must fill out an on-line registration form.

NetworkWorld Fusion

CONFERENCE PICK

HOT TOPIC

Read Marc Myers' column today, then tell him what you think online.

Select Forum, Columnists then Myers.

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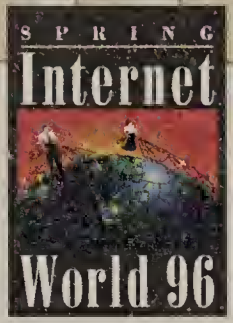

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NetworkMCI's *Gerdelman*

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NetworkWorld's *Mission: To provide news and analysis that help network IS professionals deliver the network computing infrastructure and distributed applications required to meet evolving business needs.*

News briefs, May 6, 1996

Lotus lets out a secret

Lotus Development Corp. last week previewed Webmaster's Apprentice, a tool for stepping end users through the Web page creation process, at Internet World in San Jose, Calif. Actually, there is no new technology involved: Every feature can be found in Notes software. But the company found that "no one was using it and wanted an entry point for people to get involved in publishing," a company spokesman said.

The Web host with the most

AT&T filled in another piece of its Internet services blueprint at last week's Internet World show with the launching of its Web hosting service, dubbed Easy World Wide Web Services. The base monthly price is $500, no matter the business size. That figure includes a shrink-wrapped package of the Microsoft Corp. FrontPage Web design tool, AT&T staging software that allows users to change their Web pages, and AT&T's WorldNet dial Internet access service to the staging server on the AT&T network.

Off week for mergers?

While MFS Communications Company, Inc. and UUNET Technologies, Inc. were all smiles in announcing plans for a $2 billion union, a couple of other proposed marriages went bust. BT and Cable & Wireless plc have called off merger negotiations for now, citing irreconcilable differences. Separately, after three weeks of public and often rancorous takeover talks, McAfee last week withdrew its bid to acquire Cheyenne Software, Inc.

No contest: Banyan's Mahoney stays

Mahoney

Banyan Systems, Inc. President and Chief Executive Officer David Mahoney easily overcame a campaign by two stockholders to raise doubts about his leadership, winning reelection to the board of directors last Monday with 98.3% of the vote. The two stockholders had contacted other Banyan shareholders last month through online postings and electronic mail, urging them to carefully review the company's recent performance and direction under Mahoney before the voting (*NW*, April 22, page 10).

AST takes a hit

Troubled server and PC maker AST Research, Inc. last week announced a $115 million first-quarter loss that will usher in a round of 300 layoffs as well as corporate restructuring. Revenues for the first quarter ending March 30 were $530 million, down from $670 million in the first quarter last year. The tough quarter was attributed to pricing pressure and product development problems, among other factors.

Cisco throws support behind Novell, Precept

Cisco Systems, Inc. rolled out software for its 1000 series remote access routers that allows users on Novell, Inc. NetWare LANs to access the Internet. The software, called IPeXchange, allows users on remote NetWare LANs running the IPX protocol to access the Internet without loading TCP/IP software onto clients and servers. Cisco 1000 routers with IPeXchange software are priced from $2,495 to $3,950 and will be available in June.

Separately, Cisco has acquired a minority stake in Precept Software, Inc., a maker of multimedia networking software. Cisco will resell Precept's products, and the two companies will jointly develop products.

Yeehaw! Here comes Digital's Rawhide

Digital Equipment Corp. will announce a new mid-range Alpha server this week, code-named Rawhide, with 64-bit Very Large Memory capabilities that previously have been found only in high-end models. The new product is intended to compete with Hewlett-Packard Co.'s popular K-9000 line and Sun Microsystems, Inc.'s latest Ultra Enterprise offerings, and fills a mid-range gap in Digital's Alpha line. The Alpha 4100 includes one to four 300-MHz processors, up to 4G bytes of memory and eight PCI slots. A 400-MHz model will be available by September.

Bay readies revised net mgmt. suite

Optivity 7.0 applications rely heavily on autotopology to pinpoint network problems.

By Jim Duffy
Santa Clara, Calif.

Bay Networks, Inc. this month will unveil the next major release of its network management software, which will feature enhanced configuration and fault isolation capabilities.

The new applications included in Version 7.0 of Bay's Optivity software suite will have tight links to the management program's autotopology technology, which scours the network to discover and map the devices it governs.

The autotopology-enabled applications (see graphic) will be able to better pinpoint the physical or logical location of faulty devices, chatty clients and servers, and congested links.

"We're a 5,500-node network with 400 locations, and the dynamics of changing sites takes a lot of management to keep up with," said Michael Spalter, senior vice president at Countrywide Funding Corp. in Simi Valley, Calif., which is beta-testing Optivity 7.0. "Any way that they can make this easier for us will reduce my total cost of ownership."

Spalter said Optivity 7.0's enhanced autotopology features will help Countrywide Funding better manage its distributed environment as the lender rolls out client/server applications. Optivity 7.0 applications will discover and map all network devices, and report on the relationship between network components through hierarchical views.

For example, an Optivity application that uses Remote Monitoring or RMON2 for network design and analysis can tap the autotopology capability to provide an end-to-end view of traffic behavior over physical and logical links between clients and servers.

The application would then conduct what-if network reconfiguration scenarios in which different topologies would be recommended — again, using the autotopology feature — to ease congestion or increase throughput between affected clients and servers.

Optivity operators can then reconfigure the network via drag-and-drop, point-and-click software commands, rather than physically recabling the net.

OPTIVITY 7.0'S FOCUS

- Client/server path tracing
- Fault isolation and troubleshooting
- Systemwide VLAN configuration
- Congestion management
- Traffic flow analysis
- Physical and logical views

The same scenario would be applicable to a virtual LAN environment. Indeed, one of the applications expected with Optivity 7.0 is a package that would allow users to establish policies for defining, viewing and changing logical connectivity between clients and servers. The policies would define who can change VLANs and when and how they can be changed, sources said.

As part of the Optivity 7.0 rollout, Bay is expected to unveil response-time analysis, network accounting and enterprise design tools, and the StackProbe stackable probe announced earlier this year when Bay acquired Armon Networking, Ltd. (*NW*, March 4, page 14).

Bay is also expected to unveil management applications for its Centillion switches and Xylogics, Inc. remote access gear that are more tightly integrated with Optivity, as well as Armon RMON management applications that work better with Optivity.

Pricing and availability of Optivity 7.0 was not available at press time. Bay declined comment. ■

ABEND

abend *(n)* **1:** abnormal end to a computer process **2:** the online fountain of 'Net wit and high-tech humor found on Network World Fusion (www.nwfusion.com).

Apparently, when the editors of *Network World* want a few cheap laughs, Abend is just fine. But when it's time to celebrate a decade of accomplishment, a decade of success, well, then there's no room for their little court jester, who is banished to the sidelines, the curls on his slippers drooping in shame and humiliation.

Not that we're bitter about being left out of last week's milestone issue. In fact, we have prepared our own tribute to *Network World's* 10th anniversary — 10 consecutive weeks of original Top 10 lists on network- and computer-related topics, exclusively on Network World Fusion (http://www.nwfusion.com).

Top 10 Internet movies we'd like to see

1. *Dial M for Microsoft*
2. *I Was a Teenage Cancelbot*
3. *The Hacker and the Pussycat*
4. *The Routers of Madison County*
5. *From Here to Ethernet*
6. *The Webmaster in the Cupboard*
7. *Citizen Gates*
8. *One Flew Over the Chat Room*
9. *Silence of the Spams*
10. *Das Reboot*

Visit Network World Fusion. Select NetRef then Abend.

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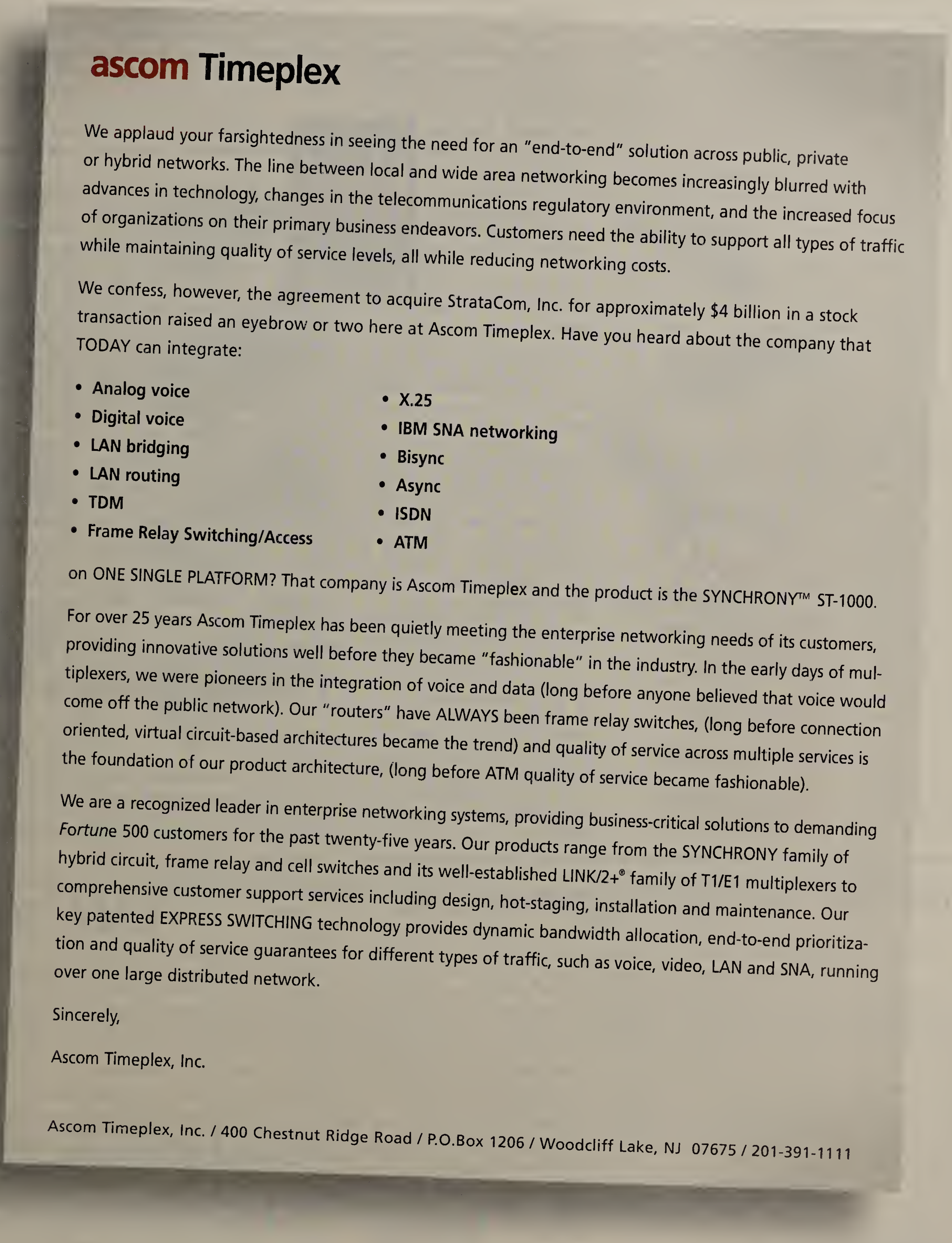

ascom Timeplex

We applaud your farsightedness in seeing the need for an "end-to-end" solution across public, private or hybrid networks. The line between local and wide area networking becomes increasingly blurred with advances in technology, changes in the telecommunications regulatory environment, and the increased focus of organizations on their primary business endeavors. Customers need the ability to support all types of traffic while maintaining quality of service levels, all while reducing networking costs.

We confess, however, the agreement to acquire StrataCom, Inc. for approximately $4 billion in a stock transaction raised an eyebrow or two here at Ascom Timeplex. Have you heard about the company that TODAY can integrate:

- **Analog voice**
- **Digital voice**
- **LAN bridging**
- **LAN routing**
- **TDM**
- **Frame Relay Switching/Access**
- **X.25**
- **IBM SNA networking**
- **Bisync**
- **Async**
- **ISDN**
- **ATM**

on ONE SINGLE PLATFORM? That company is Ascom Timeplex and the product is the SYNCHRONY™ ST-1000.

For over 25 years Ascom Timeplex has been quietly meeting the enterprise networking needs of its customers, providing innovative solutions well before they became "fashionable" in the industry. In the early days of multiplexers, we were pioneers in the integration of voice and data (long before anyone believed that voice would come off the public network). Our "routers" have ALWAYS been frame relay switches, (long before connection oriented, virtual circuit-based architectures became the trend) and quality of service across multiple services is the foundation of our product architecture, (long before ATM quality of service became fashionable).

We are a recognized leader in enterprise networking systems, providing business-critical solutions to demanding *Fortune* 500 customers for the past twenty-five years. Our products range from the SYNCHRONY family of hybrid circuit, frame relay and cell switches and its well-established LINK/2+® family of T1/E1 multiplexers to comprehensive customer support services including design, hot-staging, installation and maintenance. Our key patented EXPRESS SWITCHING technology provides dynamic bandwidth allocation, end-to-end prioritization and quality of service guarantees for different types of traffic, such as voice, video, LAN and SNA, running over one large distributed network.

Sincerely,

Ascom Timeplex, Inc.

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Internet World proves the industry is cooking

By Carol Sliwa
San Jose, Calif.

Doubting Thomases wanting tangible proof that the Internet is more than just some passing industry fad didn't need to look any farther than last week's Internet World show here.

The show was about the hottest place to be — literally. Just ask exhibitors who on opening day endured 100-plus-degree temperatures inside the oven-roaster tent erected outside the main convention hall to house the spillover of participants.

''It was cooking,'' said David Toth, vice president of Hitachi Computer Products America, Inc.'s network products group.

Internet World simply has outgrown its surroundings, coming a long way from its humble 1993 beginnings, when 50 or so exhibitors promoted their wares for some 4,000 attendees at the Fairmont Hotel here.

Attendance this year totaled about 40,000 people, and exhibitors numbered around 360. The event has grown so much that next year's spring show will move to the larger Los Angeles Convention Center. Also relocating is the East Coast fall show, from the Hynes Convention Center in Boston to New York's larger Jacob K. Javits Convention Center.

And, by next year, who knows if any of the news from last week's show will even matter in this wildly fluctuating Internet landscape.

''Come the fall Internet World, the technology could change,'' said Jeffrey Bardin, a Lockheed Martin Corp. Internet services team leader who is working on the Environmental Protection Agency's World-Wide Web site. Developers are having a hard time keeping up because as they are focusing on one project, the APIs might change in a updated version of a browser, leaving them in a quandary, he said.

Although he was interested in many of the offerings from smaller vendors, particularly products that enhance the appearance of Web pages, Bardin admitted it would be a gamble to bank on them ''because you don't know if they're going to be around.''

Will a company like GUI 'N Da Hood — Web designers from Oakland, Calif. — still be spending money on a booth at next year's Internet World? For every Netscape Communications Corp. on the show floor, there's a NetCarta, NetCentric, Net Force, net.Genesis, NetGrafx, NetLink, NetManage, NetPartners, NetPhonic, Netscan and NetSource to check out.

''Some of the upstarts have some good products . . . but if I was going to buy something, I'd probably stick to something I know will be around,'' said Bruce Sheehan, an Internet specialist with the Texas Department of Commerce.

The big, established companies made a number of announcements at Internet World. To name a few:

■ Microsoft Corp. formally unveiled its BackOffice 2.0 server software that includes its recently released Exchange Server 4.0 messaging engine, Internet Information Server 1.0 and SQL Server 6.5 database.

The Redmond, Wash., computer giant also showed off its new Internet Explorer 3.0 Web browser, featuring new voice, video- and data conferencing capabilities. In addition, it showed the latest update of its Web authoring and management software, FrontPage 1.1.

■ Netscape showcased its Navigator 3.0 Web browser featuring enhanced management and security, and tools for creating live online applications.

■ IBM updated its Internet offerings at a glitzy 90-minute presentation. Announcements included the launch of its Net.Commerce electronic commerce software for setting up virtual stores on the Internet. ■

Network World Fusion
http://www.nwfusion.com

Link to Network World Fusion for Internet tidbits, including:

- ▶ **Charts showing the growth of the 'Net**
- ▶ **Oddball Internet facts**
- ▶ **Select News+ then Intranets & the 'Net.**

Vendors promise Java in OS

By Michael Cooney and Ellen Messmer
San Jose, Calif.

As expected, the computer industry's heavyweights congregated last week at Internet World here to pledge they will add support for the Java programming language in their operating systems.

MECKLER MEDIA

Microsoft Corp., Tandem Computers, Inc., IBM, Hewlett-Packard, Co., The Santa Cruz Operation, Inc., Silicon Graphics, Inc. and Apple Computer, Inc. have all committed to adding Java support.

Until now, Sun Microsystems, Inc.'s JavaSoft division had only licensed Java for use in browsers and servers, with the exception being Novell, Inc., which had licensed it for use with NetWare (*NW*, April 29, page 10).

But Java is now the drink of choice. IBM will not only put it in all its operating systems, from the mainframe to AIX and OS/2, but will also add it to Windows 3.1 — something no one else has yet offered to do, said John Patrick, IBM's director of Internet technology. Skip McGaughey, IBM application development marketing manager, said IBM will ship Java class libraries and tools later this year as part of its VisualAge line.

Today, Java applications may reside on a mainframe but IBM's Internet Connection Server package is required for access. The new support will let users access Java applets directly over the net, improving performance and accessibility, IBM executives said. But some analysts last week questioned whether users may overdose on Java.

''The bottom line is users won't have to worry about whether they have Java,'' said David Smith, research director at Stamford, Conn.-based consultancy Gartner Group, Inc. The questions now are which version of Java and are they compatible. Microsoft, IBM, Apple and the rest will make extensions and additions in the form of APIs that could result in serious interoperability problems, Smith said.

Microsoft, in particular, with its approach of wrapping Java applets up as a type of OLE object, could undercut the portability goal of Java, he noted.

Smith said Microsoft's strategy, though useful for Windows applications, is one to ''embrace and contain Java.'' ■

'Net mail getting a serious look

By Barb Cole
Anaheim, Calif.

After years of awaiting the arrival of client/server electronic messaging, users are finally seeing products. But attendees at the messaging industry's largest annual gathering here last week were more interested in talking about the Internet.

''Let's just declare the Internet the winner,'' said an electronic mail administrator at a large pharmaceutical company in the Midwest that maintains multiple E-mail systems linked via an X.400 backbone. ''Five to 10 years from now, I know the Internet will be there. I can't say that for X.400.''

EMA 96

The 'Net appears poised to turn the messaging industry on its head, though few companies have embraced Internet messaging as a replacement for existing E-mail systems so far, said attendees at the Electronic Messaging Association 96 conference.

Internet messaging has its pros and cons (see graphic, page 65). On the plus side, it is easy to

See **E-mail,** *page 65*

CLARIFICATION

Two points in the story ''MCI 'Net service woes continue to escalate,'' (*NW*, April 29, page 10), require clarification.

The executive from Entertainment Technology Associates, Inc. was discussing his own evaluation of packet loss on the MCI Internet backbone, not packet loss for the backbone in general.

Also, while the stated delivery date for MCI's installation of a T-1 access link for ValleyNet Communications was stretched from 35 days to three months, according to the customer, the service was actually installed in two months.

XDB smooths Java's access to corporate data

By John Cox
Columbia, Md.

Those struggling to build Java programs that can access corporate databases may save time with database connectivity software from XDB Systems, Inc.

XDB software, which is a set of Java class libraries, now automatically handles much of the work needed to connect on-screen objects, such as a text field, with database tables. The result: It is easier to build true Java client/server programs that can query and update information stored in existing corporate databases.

The new software extends the capabilities of the JETConnect product, re-leased in March as the first of XDB's new line of Java Enterprise Tools.

JETConnect is a set of ready-to-use Java class libraries that, in effect, encapsulate the Open Database Connectivity (ODBC) interface, according to Kim Ball, vice president of technology for XDB, based here. Using these classes, developers can immediately link a Java application with any database that supports ODBC.

The new JETConnect version, available for free via the Web, now lets browser-based Java applets connect to ODBC data. A new process called a daemon sits on the Web server and listens for requests coming from the applet. The request is handed to the ODBC class and then to the ODBC Dynamic Link Library.

At the end of May, XDB will release JETConnect Pro, which adds two new features. First, it will support the Java Database Connectivity (JDBC) interface, which has been proposed by Sun Microsystems, Inc. as a standard way for Java applications to access databases.

The second new feature is a set of Java classes that adds ready-to-use user interface components for database applications and a simpler programming interface.

JETConnect Pro is priced at $299 and will be downloadable via the Web (http://www. xdb. com/jet) starting May 30. It is available for free evaluation until August 1.

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So this is what they call reform?

Rates for popular business and residential services have risen since President Clinton signed the Telecommunications Reform Act of 1996 on Feb. 8.

Service category	Carrier/service name	Rate on Feb. 8	Rate on May 2
		(On-net to off-net daytime rates)	
Virtual private network service	AT&T Software Defined Network	19.6 cents/min.	20.3 cents/min.
	MCI Vnet	19.4 cents/min.	20.1 cents/min.
	Sprint VPN Premiere	18.6 cents/min.	19.3 cents/min.
		(Evening rates)	
Basic residential service	AT&T	17.0 cents/min.	18.0 cents/min.
	MCI	16.99 cents/min.	17.99 cents/min.
	Sprint	17.0 cents/min.	18.0 cents/min.

All rates assume distance of 500 miles. Volume and term discounts for business services not included.

SOURCE. CENTER FOR COMMUNICATIONS MANAGEMENT INFORMATION, ROCKVILLE, MD.

Rates

Continued from page 1

tance, so why give up their profit margins today?" said Ronald West, telecommunications manager for the New York law firm of Shearman and Sterling.

Since February, basic rates for virtual private network plans have climbed upward in the same lockstep that has characterized long-distance market moves since 1993 (see graphic). And many other features have dotted the telecommunications landscape, with AT&T raising rates on its Megacom 800 service and MCI increasing rates on its Vision Outbound service.

"It's been kind of a continuation of what's been going on before," said George David, who heads the Center for Communications Management Information, a Rockville, Md., rate analysis organization. "We've not seen a significant rate decrease in anything."

A further round of rate increases is considered likely to occur this summer. "I don't think it's unreasonable" to expect such a move, conceded an AT&T spokesman.

Carrier officials last week claimed that there is pressure being exerted on their profit margins due to high local access charges, expensive billing support for low-volume customers, heavy marketing costs and inflation. They cannot wait for the new competitive landscape to sort itself out before they deal with these issues, they added.

"People are still trying to read the telecom bill, let alone create measurable conclusions from it," said Ron McMurtrie, director of business marketing for MCI Communications Corp.

The AT&T spokesman added, "The bill, for all its good intentions, in practice is not yet in effect yet."

Even residential rates — commonly viewed as a vicious battleground because of television advertising wars — have risen since Clinton's bill-signing media event. Not only have the major carriers uniformly raised their basic residential rates by a penny a minute, but they also have adjusted their special calling plans to enhance revenue.

For example, Sprint Corp. has increased the peak-hour rates for its Sprint Sense "dime-a-minute" plan from 22 cents to 25 cents per minute, and the heavily advertised 10-cent rate does not kick in until well into the evening.

For large business customers, however, carriers are making major concessions on new negotiated contracts to lock in long-term deals, and even AT&T is occasionally coming in as low bidder (*NW*, Jan. 8, page 1).

But what if you are not a new customer? There's the rub, according to a top official at second-tier long-distance carrier LCI International, Inc.

"What they're doing is raising their rates on existing customers to fund acquisitions of new customers," said Douglas Weeks, LCI's senior product manager for general business services. LCI is the only one of the top half-dozen carriers that offers a guarantee against rate increases on its standard, nonnegotiated term contracts.

McMurtrie said that MCI is going beyond traditional term and volume discounts to offset the effect of basic-rate price hikes. It is going to offer to add Internet access services, new data solutions and other services to telecommunications contracts to build volume to higher discount levels, he said.

"But what MCI and others are alluding to is they want you to increase your commitment, however they can," West said. ■

Cisco unveils Catalyst 5000 extensions

By Jim Duffy
San Jose, Calif.

Cisco Systems, Inc. last week unveiled extensions to its five-slot Catalyst 5000 switch that position it as a wiring closet alternative to shared-media hubs.

Cisco rolled out a module for the Catalyst 5000, called the group switching module, and new software. The module is a 48-port shared-media 10Base-T Ethernet board that can be segmented into four 12-port LAN hubs.

The group switching module can switch packets locally between ports or segments to configure the LANs.

Cisco believes it has a more cost-effective hub-to-switch solution than rivals Bay Networks, Inc. and Cabletron Systems, Inc. due to the architecture of the Catalyst 5000. The Catalyst 5000 sports a single 1.2G bit/sec backplane, whereas Bay's System 5000 and Cabletron's MMAC-Plus switching hubs feature multiple backplanes for different LAN media.

"When you mix and match Ethernet with FDDI or with Fast Ethernet, there's hidden cost associated with trying to integrate these multiple backplanes with each other" that drive up the price per port of those devices, said Soni Jiandani, Cisco's Catalyst 5000 product-line manager. As such, Bay and Cabletron cannot offer the price points Cisco can — $100 per port — when it comes to configuration switching of shared-media LANs, she claimed.

Thus, the group switching module makes the Catalyst 5000 ideal for replacing 10Base-T hubs in a wiring closet, Jiandani said.

That leaves room in the LAN backbone for a new 13-slot frame switch Cisco is said to be developing, which sources refer to as Quantum.

Sources said Quantum will have at least two interconnected 1.2G bit/sec backplanes and work with all of the existing Catalyst 5000 modules, but Jiandani would not confirm this. She added, however, that if Quantum should have multiple backplanes, Cisco "will not be caught making the same mistakes" as other vendors.

The group switching module costs $4,795 and will be available in July.

Catalyst gets more punch

Cisco also announced Version 2.1 of Catalyst 5000 software, which provides load balancing over trunk links, an embedded Remote Monitoring agent in the supervisor module, Simple Network Management Protocol management enhancements, dynamic configuration of virtual LANs over Fast Ethernet trunks, 802.10 VLAN frame tagging for FDDI links and a VLAN mapping protocol.

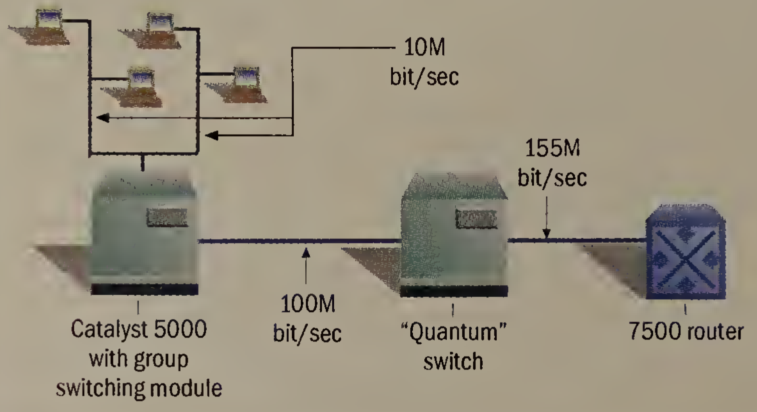
"It sounds like they probably extended some more functionality into the MIB structure with [data] access from MIBs now, whereas before it might have been through just the configuration file," said Bob Childress, a network management analyst at Texas Instruments, Inc. in Plano, Texas. "That's definitely good; the kind of stuff we like to hear."

Version 2.1 will be free to existing Catalyst 5000 users and will ship in July.

©Cisco: (408) 526-4000.

Into the closet

Cisco's new shared-media group switching module allows users to push the Catalyst 5000 out to wiring closets, making room in the backbone for Cisco's upcoming 13-slot "Quantum" switch.



MCI One ties it all together

By Joanie Wexler

One promise of telecommunications reform — the ability to buy many integrated services from one carrier — is materializing.

MCI Communications Corp. last week announced MCI One, a communications kit for small businesses and consumers starting at $4.95 a month. The offering bundles long-distance service, Internet access, voice mail, a calling card, cellular and paging services, a personal 800 number and even home security services. Later this year, local-loop and PC installation and training services will be added to the mix.

Starting at $37.95 a month, MCI adds a pager with unlimited service and a cellular phone with unlimited cellular long distance.

Charges for all services appear on one bill, and the personal 800 number can follow and find users across multiple services. And there is one customer service number to call.

Analysts said corporate buyers of network services can take MCI's move as a cue that better service integration packages are en route for them, too.

To a large degree, large business customers already can get bundled services and consolidated billing. Still, carriers have been precluded from participating in certain markets either by regulation or economic disincentives.

Now they are "reengineering their service platform structures" and billing systems to handle a wider breadth of offerings, said Joe Baylock, vice president and research area director at Gartner Group, Inc. in San Jose, Calif.

Jerry Michalski, an editor at "Release 1.0," an industry newsletter in New York, said AT&T will likely bundle its network services, Universal credit card, DirecTV broadcast satellite service and equipment from partner Hughes Electronics Corp.

An AT&T spokesman declined to say if or when that would happen. ■

CORRECTIONS

We neglected to credit White Packert Photography for the cover photography of our April 29 issue.

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business on
the Internet
without
getting

bamboozled

by some
wily
hacker?”

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Digital to blast data from IBM mainframes

By Michael Cooney
Maynard, Mass.

Large server users that need to off-load tons of mainframe data to Unix databases may be intrigued by a solution being announced this week by Digital Equipment Corp. and Bus-Tech, Inc.

According to Digital, it will use Bus-Tech mainframe connectivity products to build high-speed pipes between its servers and IBM mainframes. The combination of Digital's AlphaServer family and Bus-Tech's DataBlaster mainframe channel interconnect boxes will save mainframe cycles, enable new data mining applications and improve the performance of bulk data transfers, according to the company.

And Digital will not be the only server outfit to employ this option. Bus-Tech executives indicated Tandem Computers, Inc., Unisys Corp. and others will also be taking this route to mainframe data.

As users move data off the mainframe or attempt to utilize mainframe data more efficiently in a client/server fashion, building high-speed pipes between the Big Iron and large servers will become an issue. This is especially true when the ever-growing presence of TCP/IP is considered; TCP/IP's performance when handling large amounts of data has always been suspect, analysts said.

"Because our business depends on high-speed data transfers, we needed products that could get us up to the 3M to 4M bit/sec transfer range between the server and the mainframe, and there was nothing out there that could deliver those speeds," said Chuck Howland, business development manager of research and development at Axiom Corp., an international mailing, data integration and data warehousing firm in Conway, Ark. "With the DataBlaster, we are seeing sustained transfers of between 3M and 3.5M bit/sec."

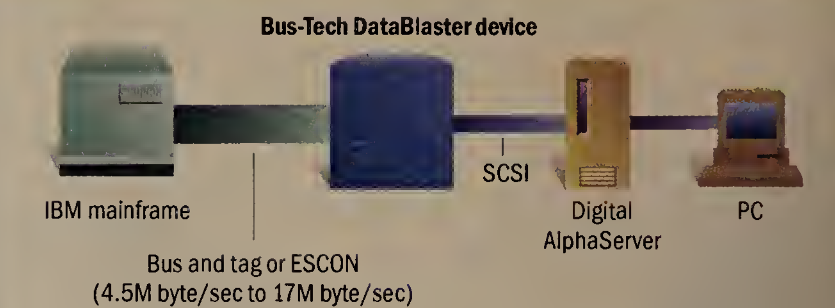
"Users downsizing applications or doing data mining activities are finding that they can only get kilobits per second of performance between their workstation and the mainframe because of gateways or the overhead of net protocol processing," said Joe Makoid, vice president of sales and marketing at Bus-Tech.

Under the Digital agreement, Bus-Tech will couple its DataBlaster products with AlphaServers running Digital Unix, Open VMS or NT operating systems.

DataBlaster I and II are available now and start at $8,500 and $15,000, respectively.

©Bus-Tech: (215) 230-7870.

Blasting for data



The coupling of Digital's AlphaServer and Bus-Tech's DataBlaster enables servers running database, data mining or other applications to access data from a mainframe at speeds from 4.5M to 17M byte/sec. The DataBlaster eliminates the need for a gateway.

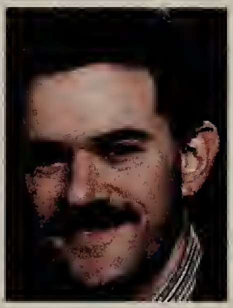
GRAPHIC BY TERRI MITCHELL

MFS

Continued from page 1

Insurance Co. in San Francisco, who expects to see the ISP market shake out to about a half-dozen Internet providers. "There are so many people dumping into the 'Net now, it is difficult to do metering and statistical analysis on traffic," he said.

Michael Zivich, telecommunications manager at Spiegel, Inc. in Chicago, agreed. "It takes big players to provide the reliability needed before large companies will count on the Internet the way they would a leased-line network," he said.



UUNET's *Taffel is committed to passing savings on to customers.*

The concept of getting the 'Net to begin approaching quality-of-service levels akin to those of the phone network is not lost on UUNET's competitors: Apex Global Information Services (AGIS), PSINet, Inc. and possibly AT&T are expected to soon announce service guarantees, too (see story, this page).

And ISP BBN Planet, which carries the traffic of AT&T's dedicated-access customers, is expanding its own T-3 backbone domestically and stretching to other parts of the world through a recent partnership with international carrier Scitor (*NW,* April 1, page 14). "We're carrying traffic as far as we can on our own network to keep service levels up," said BBN Planet Chairman George Conrades.

MFS runs an all-fiber WAN backbone, as well as metropolitan-area redundant rings in 49 cities worldwide. For the short term, only the local-loop portion of MFS' network — which passes about 70% of the U.S. business population's doorways — will combine with UUNET's long-haul net.

"This should alleviate congestion on the access portion of an Internet connection," said Ullas Naik, vice president of technology research at First Albany Corp., a financial analysis firm in Boston.

It should also cut down on access prices. UUNET will be able to get local-loop access at cost instead of at retail rates. UUNET's Taffel said he is committed to passing the savings to customers. He added that local-loop costs account for 40% of the total Internet access cost and that UUNET customers will likely save half that through the combined company.

Match made in heaven

UUNET and MFS have many things in common: They both target corporate customers and run redundant networks. Each already has a global presence with lofty aspirations to expand into more countries. And neither has ever turned a profit, although MFS reportedly has $800 million in the bank and UUNET is headed in the right direction. Last week, UUNET reported net income of $233,000 for the first quarter compared to a net loss of $263,000 in the same quarter last year.

Despite MFS' rich coffers, "both companies still need other sources of capital to continue rolling out transoceanic fiber," warned Steve Franco, senior analyst at The Yankee Group in Boston. That issue, and how to eventually blend UUNET's frame relay backbone with MFS' long-haul Asynchronous Transfer Mode net, will be among the merged company's challenges, he said.

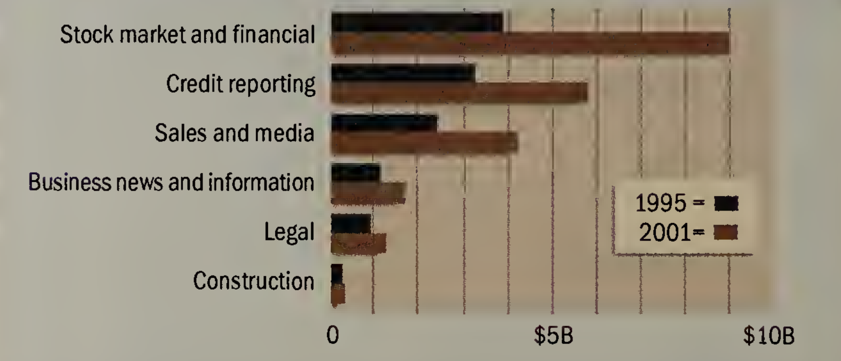
UUNET — along with many of its competitors — already purchases large volumes of local access services from MFS. UUNET currently buys MFS access for users of its 10Plus offering, a 10M bit/sec Ethernet service. For T-1 and other speed connections, however, UUNET resells local Bell services, though Taffel said those services will eventually jump on the MFS network, as well.

He added that voice and video services will run over the combined network within two years.

Other ISPs said they are not worried that MFS will discriminate against them in terms of interconnections and service because they represent too large a volume of business for the carrier. ■

A market too good to pass up

The MFS/UUNET combination could reap huge revenue based on current and projected spending for online services by these vertical industries:



GRAPHIC BY TERRI MITCHELL

SOURCE: INSIGHT RESEARCH, LIVINGSTON, N.J.

MERGER FACTS AND FALLOUT

- Microsoft, which has a 13% stake in UUNET, will have a 4% share of the combined company.
- Voice and video services are expected within two years over merged networks that will be packet-switched end to end.
- MFS Communications will have two groups: Telecommunications Services, led by MFS President and Chief Operating Officer Royce Holland; and Internet Services, led by UUNET CEO John Sidgemore.
- MFS and UUNET will retain their names as business divisions of the same company.
- The agreement has been unanimously approved by both firms' boards.

ISPs making commitments

Internet service providers (ISP) have figured out that they will need to offer quality-of-service guarantees before corporate IS departments really take the Internet seriously.

As UUNET Technologies, Inc. readies such guarantees, competing 'Net backbone provider Apex Global Information Services is gearing up to announce a three-tier offering in the third quarter, according to AGIS President Phillip Lawlor.

AGIS is still working out the metrics for network availability, installation time, escalation procedures and other factors. The highest level agreement will be aimed at real-time applications such as Internet phones and video; the mid-tier option will target applications such as Web browsing; and the lowest level agreement will cover store-and-forward applications — the one least picky about 'Net delays.

PSINet, Inc. is looking to deliver service-level guarantees later this year. It is uniquely positioned to offer such agreements in that it does not sell 'Net access services to resellers that themselves act as ISPs. Thus, PSINet can avoid congestion caused by these resellers overselling capacity.

—Joanie Wexler

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why it brought down
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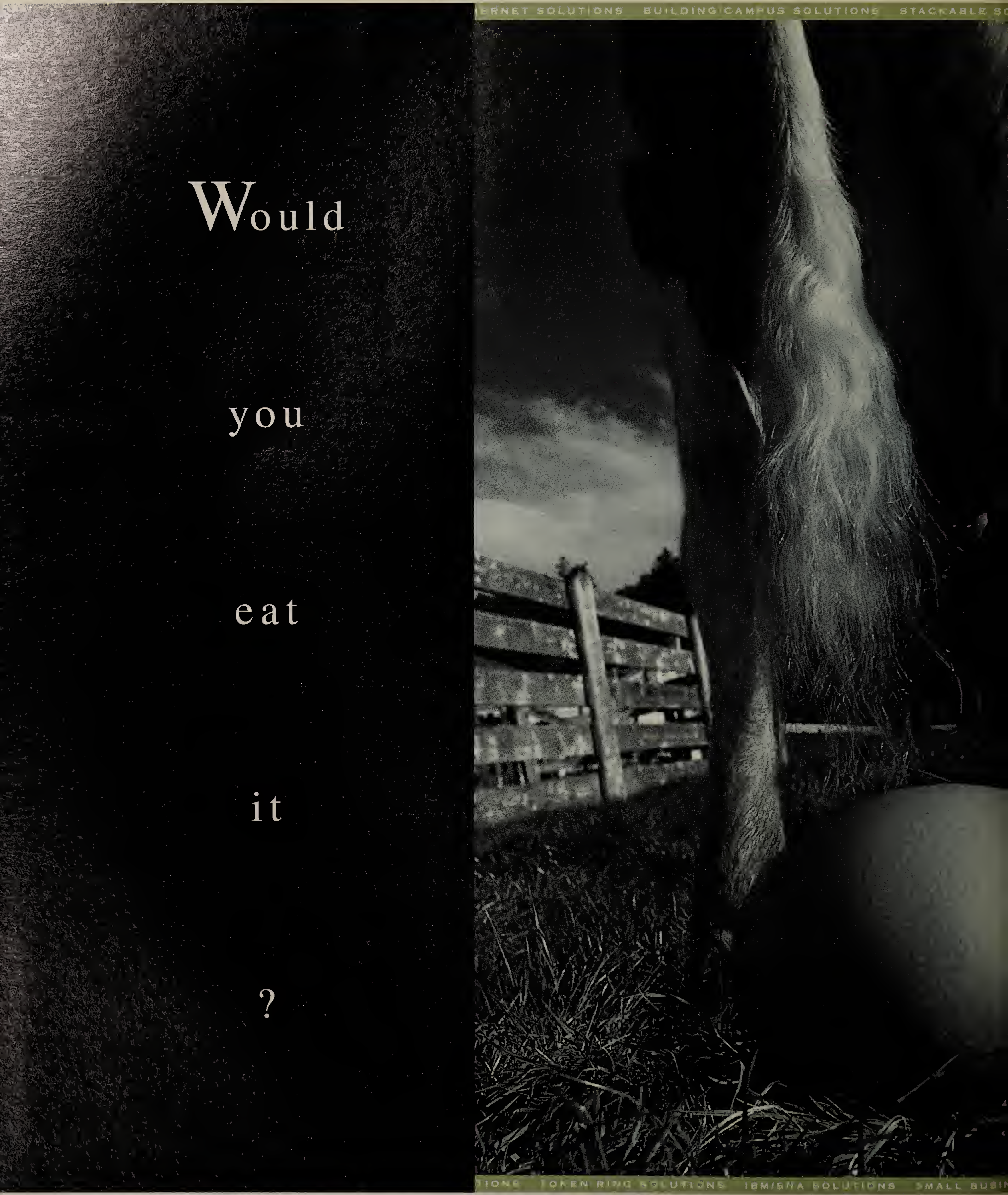

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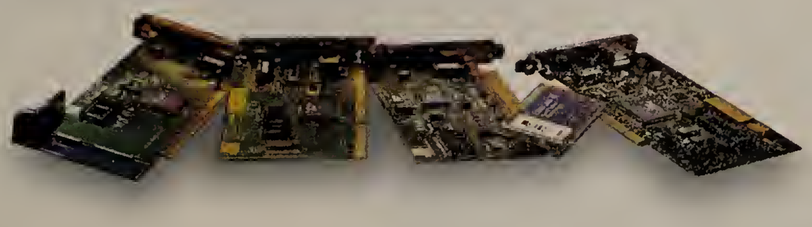

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Briefs

■ *Market research firm* **Frost & Sullivan, Inc.** *is predicting zooming growth for* **call center hardware and software.** *The company attributes the growth to several factors, such as companies setting up call centers for customer service and revenue generation; smaller companies establishing toll-free lines; and companies choosing telephony over direct mail to receive immediate marketing feedback.*

■ **Hewlett-Packard Co.** *last week unveiled a low-end version of its IT/Administration* **change management software** *for workgroups.*

HP OpenView IT/Administration for Workgroups is targeted at users managing workgroup-sized domains. It allows managers to distribute software, administer file and print services, and inventory hardware and software for as many as 250 nodes from a central Unix- or Windows-based NetWare client. IT/Administration for Workgroups costs $2,600 and will be available this summer.

HP: (800) 752-0900.

■ **Digital Equipment Corp.** *last week rolled out two new members of its RouteAbout* **remote access routers.** *They are RouteAbout Access EI for connecting remote Ethernet LANs to central sites over ISDN Basic Rate Interfaces and RouteAbout Central EW for central sites that fan in eight T-1 connections from multiple remote sites.*

RouteAbout Access EI costs $2,500 to $2,900, and RouteAbout Central EW ranges from $7,995 to $8,995. Both are available now.

Digital: (800) 344-4825.

■ **General Signal Networks** *last week announced a 256-port* **Enterprise Systems Connectivity (ESCON) Director** *for IBM mainframe channel connectivity. ESCON is IBM's fiber-based mainframe channel connectivity technology. The Channel Director/9000 (CD/9000) supports as many as 125 ESCON connections.*

General Signal Networks: (609) 234-7900.

Merger mania

StrataCom users mostly toast Cisco wedding

By Tim Greene and Jim Duffy

San Jose, Calif.

While users of StrataCom, Inc. switches reacted favorably to the company's marriage with Cisco Systems, Inc., some Cisco shops are looking for assurances that their ATM switch investments will be protected.

For some, the $4 billion deal is a long hoped for turn of events.

"We've been looking at StrataCom for years and saying to them, 'You have to find a good partner to ensure interoperability in an end-to-end network,' " said John Boyd, supervisor of communications systems engineering at Berlin, Conn.-based Northeast Utilities, a staunch supporter of the company's products for years.

CompuServe, Inc., which uses both Cisco routers and StrataCom switches, expects more synergy now between the Cisco and StrataCom products, said Robert McKinney, manager of internetworking services for the Columbus, Ohio, service provider.

Yet the acquisition makes users of Cisco's LightStream 2020 ATM switch a little uneasy.

"We're certainly concerned," said Jim Nemchak, director of network services at the University of Colorado's Health Sciences Center in Denver. "I've got meetings set up with some of [Cisco's] management to find out what exactly their strategic approach is going to be for continued production and manufacture of the product and, more importantly, its evolution as a flagship ATM product for them."

HOLY MOLEY!

Richard Moley, president of StrataCom, owns 2.4 million shares of the company that were worth $93 million the Friday before the Cisco deal was announced.

StrataCom offers three switches: IPX, a 32-slot, 32M bit/sec fast-packet switch; IGX, a 1.2G bit/sec ATM switch with interfaces for legacy data and voice that comes in eight-, 16- and 32-slot versions; and BPX, a 20G bit/sec ATM carrier backbone switch.

Cisco's LightStream 2020, meanwhile, is a 12-slot, 2G bit/sec WAN access and enterprise ATM switch. Cisco is also developing the LightStream 2080, which is expected to sport up to 10G bit/sec of ATM switching capacity and ship later this year (*NW*, Dec. 18, 1995, page 1).

Cisco is now positioning the 2020 as a campus backbone switch and claims there is no overlap with the StrataCom line. The 2080, though, may never make it out of Cisco labs.

"The 2080 is a good question, and we did not get an answer to that," said Melinda Le Baron, research director in Gartner Group, Inc.'s Network Computing Infrastructure group.

Boyd said Cisco seemed to make a false start toward offering a WAN switch by buying LightStream, but the StrataCom deal feels good. "This is the winner, this is the right wide-area strategy for Cisco," Boyd said.

Others, though, say Cisco has its work cut out for it vis-a-vis StrataCom and LightStream.

"I think the biggest challenges are going to be for Cisco to sort out what it means to their LightStream product line," said Dave Nikolejsin, executive director of network services for the Information Technology Services Division of the Province of British Columbia in Canada. "We're in the process of taking a look at some products — Cascade [Communications Corp. switches vs. LightStream vs. StrataCom — so this makes that analysis a little more interesting." ■

Scottsdale gets down to business with ATM

In-Site

By David Rohde

Scottsdale, Ariz.

There is at least one wide-area ATM user that is not engaging in exotic exercises such as flipping images of X-rays, exploring seabeds for oil or entering virtual reality.

The city of Scottsdale soon will be using its Newbridge Networks, Inc. ATM access and workgroup switches to perform some of the most prosaic tasks imaginable, such as answering citizens' questions about their utility bills and recording real estate deeds.

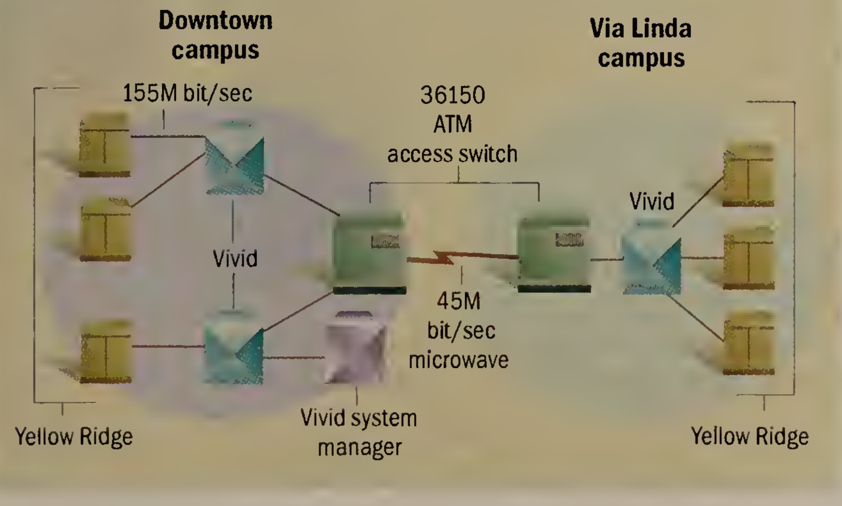
The city recently announced to its 170,000 citizens that it has installed a private ATM/fiber network throughout the Chile-shaped, 32-mile-long municipality to carry data traffic to its many remote government offices without using the phone company.

Integral to the nearly $2 million project are two of Newbridge's 36150 MainStreet ATM access switches. One is located in the basement of a civic building in downtown Scottsdale at the south end of the city. The other is located further north in the Via Linda section, where many additional government offices — including police headquarters — are located.

Connecting over local fiber recently installed by the city, 36,150 switches deliver cells to several of Newbridge's Vivid workgroup switches, which then send traffic via OC-3 (155M bit/sec) fiber connections to 10M bit/sec Newbridge Yellow Ridge Ethernet switches in individual government buildings. The two access switches themselves are connected via an existing DS3 (45M bit/sec) microwave link (see graphic).

ATM for the MAN

Each principal building in Scottsdale's city government has one or more Newbridge Yellow Ridge Ethernet switches connected to an ATM LAN and a metropolitan-area network.



Why ATM? Because nowadays municipal government applications involve imaging systems that chew up bandwidth, explained Greg Larson, the city's chief information officer.

Scottsdale maintains a geographic information system (GIS) that harnesses overhead photographs and other image data to represent the city's water, sewer, roadway, construction and land parcel assets. In fact, the city has developed its own GIS software that complies with Microsoft Corp.'s OLE so that, for example, an image of a land parcel can be incorporated into a word processing document.

And using an imaging application, a customer's utility billing history will be just a few seconds away on a utility department representative's PC.

Most of these applications are not in place yet, however. For example, the utility application depends on synchronizing the loading of a customer's utility record on a PC with the arrival of a telephone call. So the city is including computer-telephone integration as a requirement in a procurement for a new private branch exchange system due for completion by summer 1997. ■

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FRAME RELAY IS NOT A RACE

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BUT IF IT WERE, WE SEEM TO HAVE TAKEN THE LEAD

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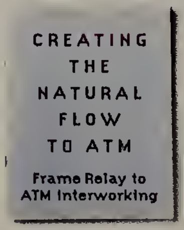

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Fax finds more efficient routes

Start-up to help users move fax traffic onto private nets and the 'Net.

By Joanie Wexler

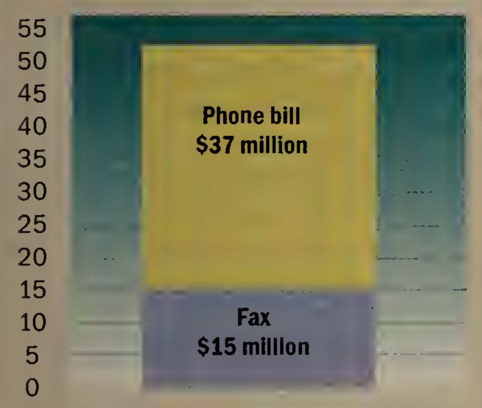
San Francisco

A spin-off of hubmaker LanOptics, Inc. is touting NetXchange Communications, Ltd.'s routing software that makes it easier to move fax traffic onto private corporate backbones and to send it over the 'Net.

Traditionally, fax traffic has run over outside phone lines or special fax networks, rather than dedicated corporate networks. This is because, until recently, "running fax traffic over highly compressed voice lines [through a private branch exchange] has been technically problematic," said Steven Taylor, president of Distributed Networking Associates, a consultancy in Greensboro, N.C. Companies also lacked the technology needed to determine the best route for fax traffic to travel.

TOO BIG TO BE IGNORED

According to a survey of 312 Fortune 500 companies, their average monthly phone bill is $37 million, while their monthly fax charge averages $15 million — prompting such firms to consider using the 'Net and other means to cut communications costs.



SOURCE: GALLUP/PITNEY BOWES SURVEY

The goal of NetXchange's Fax Exchange products is to help companies reduce the amount of fax traffic they send over public voice lines. Many large companies currently spend millions of dollars on telecommunications services for sending faxes (see graphic).

Beginning next month, the company will offer its Windows NT-based Fax Exchange servers to both corporate users and Internet service providers (ISP).

The Simple Network Management Protocol-based fax servers will sit on LANs and communicate with each other via traditional routers such as those from Cisco Systems, Inc. The servers work together to determine least-cost routing when public lines must be used and reroute faxes if there is a failed line.

The company intends to extend the corporate network using the Internet by convincing ISPs to run Fax Exchange servers on their premises, said Israel Drori, NetXchange president. Several ISPs are reportedly serious about offering a service based on the products. Ultimately, ISP buy-in will determine how valuable the product is to a corporation, said Peter Davidson, president of Davidson Consulting, a Burbank, Calif., firm focused on fax technology and trends. This is because anywhere a fax must go off-net, it will have to use a public network if ISP support is not available, according to Davidson.

To make the Internet reliable enough for fax traffic, NetXchange has invented two protocols: Simple Fax Transport Protocol (SFTP) and Dynamic Bandwidth Allocation Protocol (DBAP). SFTP allows two Fax Exchange servers to set up peer-to-peer, real-time sessions with no storing and forwarding between hops across the Internet, said David Blumberg, a NetXchange vice president. SFTP enables packets to be transmitted across the Internet in their proper order, he said.

The company's DBAP throttles back or speeds up transmissions as network bandwidth contracts or expands.

The move could be the shot in the arm for 'Net-based voice, fax and other real-time applications. The Fax Exchange products are compatible with Microsoft Corp. Exchange's universal mailbox, for example, which will also accommodate voice mail.

& NetXchange: (415) 346-4131.

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The long road to open PBX platforms

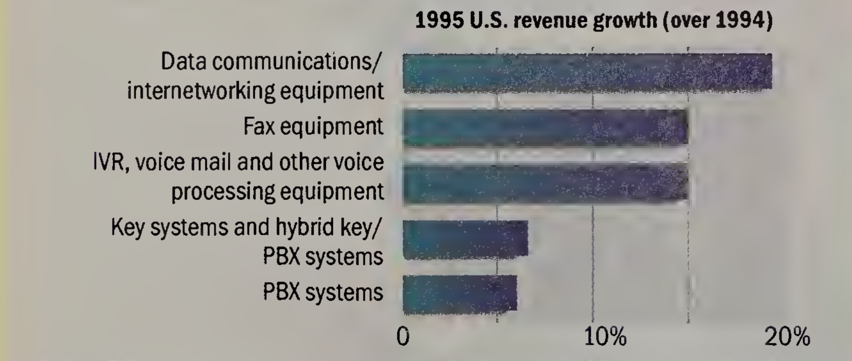
By David Rohde

If your company is in the market for a private branch exchange (PBX) system and you start talking to vendors, it may feel like you've been transported to the data world.

These days, most of the top PBX vendors are starting to distribute the functionality of their switches across network links. So you're likely to hear the words "client" and "server" as often as good old telephony terms such as "trunk groups" and "hunt groups."

Still chugging along

Compared with the data networking market, the PBX market is growing slowly, though some adjuncts are growing faster.



GRAPHIC BY TERRI MITCHELL

SOURCE: MULTIMEDIA TELECOMMUNICATIONS ASSOCIATION, WASHINGTON, D.C.

For example, next week Siemens Rolm Communications, Inc. will jump on the TCP/IP bandwagon by launching an architecture in which call-control instructions from its flagship 9751 Computerized Branch Exchange are shipped along Ethernet links to call-center agents and supervisors. This provides access to management reports by workers on a different corporate LAN. The move follows similar efforts by Lucent Technologies, Inc. and others to open up their switch architectures to TCP/IP networking.

So does that mean PBX systems are now fully interoperable? Don't bet on it. Achieving true feature transparency across multiple PBX systems still depends largely on opening the switch fabric to standard protocols such as Asynchronous Transfer Mode — a process that Lucent is not slated to complete until 1998 for its Definity switch. And as far as off-the-shelf applications from independent software vendors go, the market is still in its infancy.

In some areas, PBX makers have engaged in standards initiatives only to regroup months or years later after the purported standard failed to gain vendor support or was not robust enough for users.

Case in point: voice mail. In the early 1990s, PBX vendors joined with makers of standalone voice mail systems to develop the Audio Messaging Interchange Specification (AMIS).

The standard's analog version was completed several years ago, but its digital cousin was designed to integrate electronic mail and fax by sitting on top of the TCP/IP stack's Simple Mail Transfer Protocol (SMTP).

When the big voice vendors could not entice E-mail vendors to join them in the effort, they went the other way, contributing their work to a committee of the Electronic Messaging Association (*NW*, July 18, 1994, page 1). As a result of work done by the EMA committee, the digital specification reappeared last week as Voice Profile for Internet Mail (VPIM) in a demonstration at the EMA '96 show in Anaheim, Calif.

But VPIM's backers, including voice mail king Octel Communications Corp., conceded last week that VPIM is a "work in progress."

Meanwhile, the standard that has actually been available for use during the past few years — analog AMIS — has failed to gain a large following. "Most companies are not using AMIS today," said John Lenihan, director of marketing for multimedia messaging at Northern Telecom, Inc. "It did not have a lot of feature content, and the user interface wasn't very good."

In fact, Octel officials attribute their voice mail market leadership to the fact that they have not relied on standard interfaces but rather have built proprietary interfaces to more than 120 different models of PBXs.

The voice market is suffering from similar hiccups in the effort to integrate new TCP/IP-based voice switching systems with emerging switched data networks.

For example, Lucent's entry into integrating voice switching with data architectures is the Multimedia Communications Exchange server. The MMCX takes call control instructions from Lucent's Definity switch and translates them across a TCP/IP net to Ethernet switches, allowing real-time setup of multimedia sessions synchronizing voice, data and graphics (*NW*, Nov. 6, 1995, page 17).

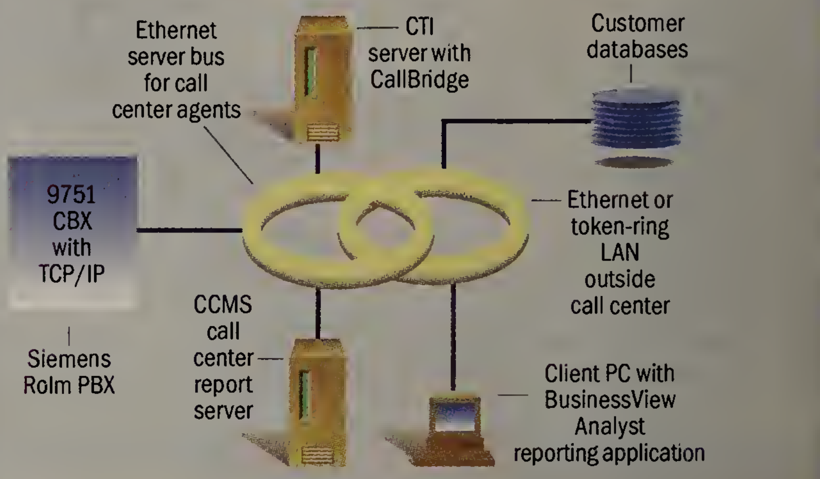
The product was originally demonstrated by McDonald's Corp. for collaborating on store designs in real time. But McDonald's is no longer using the product, a Lucent spokeswoman conceded. That is because McDonald's is looking for client support on Windows PCs, while the first commercially available version only supports Unix workstation clients.

Industry officials acknowledged that because PBX market shares remain relatively static for years at a time — Lucent and Nortel continue to split about half of the market, and Siemens Rolm takes about 15% — the top vendors are reluctant to take too many chances.

Analysts suggested that users involved in any request for proposal take a serious look at some smaller PBX vendors — notably Mitel Corp., Comdial Corp. and Ericsson — that have recently introduced open PBX platforms. At least that will keep the pressure on the big players to keep developing toward interoperability, they said. ■

SIEMENS ROLM GETS TCP/IP SPIRIT

The No. 3 PBX maker introduces a standards-based architecture where users outside a call center can pull up real-time reporting applications:


Ethernet server bus for call center agents
CTI server with CallBridge
Customer databases
9751 CBX with TCP/IP
Siemens Rolm PBX
Ethernet or token-ring LAN outside call center
CCMS call center report server
Client PC with BusinessView Analyst reporting application

Reporting standards effort draws thin support

By David Rohde

Check into reporting for inbound call centers and you'll find a prime example of the PBX industry's difficulty in drawing up standards.

Reports are the lifeblood of call centers that generate revenue from customers' telephone calls, typically over toll-free lines. In response, the reporting systems from most of the leading PBX vendors and manufacturers of specialized automatic call distribution (ACD) systems now let users slice and dice the information in dozens of customized ways and present them in beautiful graphical form.

But woe to the administrator who wants to combine reporting information from one call center with, say, a Lucent Technologies, Inc. Definity G3 private branch exchange, another with a Northern Telecom, Inc. Meridian 1 PBX, and a third with a Spectrum ACD from Rockwell International Corp.'s Switching Systems Division.

That's the job facing a new industry committee being spearheaded by Judy King, product marketing manager for Rockwell's Information Gateway Architecture. But Rockwell may have to do it without much cooperation from those who really count.

For starters, Rockwell and ACD rival Aspect Telecommunications, Inc. offer reporting systems with Open Database Connectivity-compliant databases, at least on their recent software releases.

But others, such as Nortel and Lucent, continue to use proprietary databases, King said. As a result, an interface analogous to a print driver would have to be written for each of the non-standard databases to place captured data into a single data repository.

Standards don't solve it all

Even if all the top vendors offered standards-compliant databases, the data elements themselves would still have to be synchronized, King said.

In addition, different vendors define even common reporting statistics differently. One such example would be how many calls were "offered" to the switch, including those that resulted in busy signals.

To standardize reporting for its own customers, Rockwell's Information Gateway Architecture offers a common data repository for the Spectrum switch and all its adjuncts, such as an interactive voice response (IVR) system (*NW*, Oct. 9, 1995, page 22). But last week — when the Rockwell-spearheaded standards committee was scheduled to officially name itself at a meeting hosted by AT&T — it was missing the top three PBX vendors: Lucent, Nortel and Siemens Rolm Communications, Inc.

"Rockwell is trying to do it using their approach," complained Mark Sauer, director of call center markets for Siemens Rolm. And Nortel spokesman Brian Murphy complained that Rockwell's invitations to the meetings tend to come at the last minute and have been routed to people who have left Nortel. ■

WANs & Internetworking

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Briefs

■ **MFS Communications Company, Inc.** *last week asked the Federal Communications Commission to force the city government of Washington, D.C. to allow it to offer switched services in* **competition with Bell Atlantic Corp.** *MFS is the first carrier to petition the FCC to use its power to preempt city and state laws that do not conform with the Telecommunications Act of 1996. Bell Atlantic, citing its burden to serve all of the city's citizens, so far has successfully opposed a Washington City Council bill that would open up the telephone market in the nation's capital.*

■ **France Telecom (FT) and Germany's Deutsche Telekom (DT)** *have completed their planned* **investment in Sprint Corp.** *stock. Completion of the $3.66 billion transaction follows the heavily conditioned FCC approval of the deal last December and the three carriers' launch in January of their Global One joint venture.*

■ *Yet at the same time, the FCC has denied an application by carrier* **ACC Global Corp.** *to resell* **international private lines** *for the provisioning of switched services between the U.S. and both France and Germany. The FCC ruled that France and Germany still do not offer realistic opportunities for U.S. carriers to compete against FT and DT. The commission suggested that ACC reapply when the two European markets are more liberalized.*

■ **TCI Telephony Services, Inc.,** *a subsidiary of cable TV king Tele-Communications, Inc., last week filed with the state of Connecticut to become a* **local exchange carrier.** *TCI said it would also file soon in Illinois and California.*

TCI is one of three cable companies that was slated to sell wireline telephone services through a joint venture with Sprint Corp. But that agreement collapsed earlier this year, even though the foursome is still building a digital wireless network.

MCI has intranet fever

Q&A

As the president of MCI Communications Corp.'s networkMCI Services, John Gerdelman wants to weave the power of the carrier's internal computer network operations with its public network infrastructure to quickly deliver new services to corporate customers.

That will keep Gerdelman in the hot seat for a while to come, given the increasing pressure on local and long-haul carriers as they go for one another's throats in the wake of telecom reform.

MCI's *Gerdelman to weave internal net operations with public network.*

Gerdelman oversees the deployment of new technologies in the MCI network, as well as the IT systems that run services such as Friends & Family, 1-800-COLLECT, Vnet and ProofPositive.

At the recent NetWorld+Interop conference in Atlanta, Gerdelman spoke with *Network World* Editor in Chief John Gallant about MCI's strategy for Internet access and intranets, as well as other challenges facing the No. 2 long-distance company.

Internet access is going to be a big market for all carriers. Can you differentiate between MCI's Internet access strategy and that of the other long-distance carriers, especially with regard to the business customer?

For us, the key issue is just keeping up with capacity, trying to fill the demand. I mean we're talking 20% growth month to month. We're trying to figure out what [customers] need and make sure they have the access services that are suited for them, whether it's T-1 or ISDN.

Your big corporate customers have custom network contracts. Do you envision weaving Internet access into those deals?

Absolutely. Customers are demanding it. They suddenly see the power of intranets, what they can do once they connect to that IP backbone and information is shared across the country. Not only does MCI want to be the telecommunications provider, but it wants to provide a full range of services.

AT&T announced Internet access in a big way a few weeks back and has stumbled in the implementation. What does that say about the difference in your corporate approach to the Internet?

Actually, we're excited about more usage of the Internet because 40% of Internet traffic runs on our backbone. That's a nice problem to have. AT&T can offer that service, and it opens up more doors for us because some of that traffic will be on our backbone.

How do you envision the intranet concept changing the way people use the network or use services?

We're going to see a shift from talking so much about the Internet to talking about the intranet. We're seeing four to five times the growth in intranets than we're seeing with the Internet because customers want that protection inside the firewall.

But is there anything you have to offer in the way of different services in order to support those intranet efforts?

One thing about information is that it's no different if it's on your PC, or on a television, or in a presentation.

What MCI can offer is a full range of services. We'll be able to help customers not only put up a Web site but help them develop, change and keep current on what information is on that Web source. ■

NetworkWorld Fusion

Find the full text of this interview on Network World Fusion (http://www.nwfusion.com). Select News+, then WANs & Internetworking.

Tandem gets nonstop savings from VPN

By Tim Greene
Cupertino, Calif.

Tandem Computers, Inc. is saving big money on voice phone calls by discouraging itinerant workers from using credit cards to call into Tandem offices around the world and encouraging them to tap into the company's virtual private network (VPN) instead.

The $75,000 that Tandem spent for the Priority Call Management system, plus the cost of test-driving it and training users, will be paid off within six months, according to Warren Kirsch, Tandem's worldwide telecommunications manager.

It will save him at least $480,000 during the first 12 months at its current rate of use. And there are hundreds of users he has yet to bring on to the system.

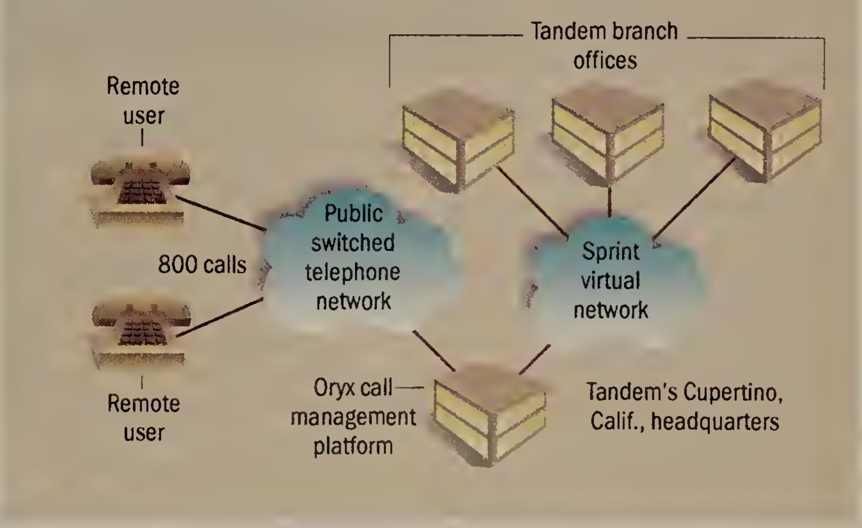
The key to the savings is tapping into the VPN service Tandem buys from Sprint Corp., which offers less expensive per-minute rates than credit card calls.

For example, a Tandem worker on the road in Washington, D.C. could call the London office for 48 cents a minute with a credit card.

But with the Oryx call management platform from Priority, that cost can be cut to 26 cents per minute. The user makes an 800 call to Tandem's Cupertino office for 8 cents a minute, punches in account and personal identification numbers and passwords, and gets connected to London over the VPN for another 18 cents a minute, saving 22 cents.

Taming toll fees

Tandem is cutting its long-distance costs with a Priority Call Management platform and a Sprint virtual private network.


Tandem branch offices
Remote user
800 calls
Public switched telephone network
Sprint virtual network
Remote user
Oryx call management platform
Tandem's Cupertino, Calif., headquarters

Once connected to the Oryx system, the remote user's phone has all the capabilities of a phone on the network, including access to voice messaging and seven-digit network dialing. And users can string together several calls during one session.

The Oryx platform also generates billing information so the user's department is charged the proper amount. That eliminates the costly, labor-intensive chore of sorting through individual credit card statements, figuring out which department that account belongs to and entering the expenses in a general ledger.

The call management box was installed last summer and went through phases of testing until February.

Tandem owns just one of the Unix-server based Oryx systems but is considering more for its Tokyo, London and Singapore offices, which have a lot of in-country itinerants for whom it is difficult to contact the Cupertino platform. ■

WAN MONITOR

SNA over frame relay: What to look for

It is estimated that as many as half of all frame relay users today are running at least some SNA traffic over the network. And as many as 75% plan to support both SNA and LAN traffic in the next two years.

Nina Saberi, president and CEO of NetLink, says that many SNA users see cost savings of 20% to 50% using frame relay vs. private lines. The network savings alone will usually pay for the equipment in approximately a year.

While these savings are very attractive, you need to consider several issues when looking at moving branch SNA traffic to frame relay. For instance, there are at least two different approaches to evaluate: Data Link Switching (DLSw) and RFC 1490.

DLSw was designed for a highly meshed private-line environment and handles SNA by first encapsulating the SNA packet into a TCP/IP packet and then encapsulating this into frame relay. Typically, SNA polling is terminated locally so that response times are improved and the danger of session timeouts is reduced.

The advantages of DLSw are SDLC-to-LLC2 conversion, broadcast reduction and nondisruptive alternate routing.

The biggest problems with DLSw are the additional overhead and loss of determinism, management and visibility. Research done by Strategic Network Consulting estimates that the added bandwidth cost generated by the overhead of DLSw is $8,500 per month for a 100-node SNA network.

The overhead that DLSw adds to a packet is about 56 to 82 bytes. According to Todd Krautkremer, vice president of marketing at Sync Research, the average size of an SNA packet is 200 to 1,200 bytes, while transactions from devices such as automatic teller machines are only 2 to 8 bytes. In either case, the DSLw approach adds a high level of overhead that increases network congestion on low-speed connections of 56K bit/sec or below.

On the other hand, RFC 1490 encapsulates SNA and other protocols directly into frame relay without first encapsulating them into TCP/IP, which means no additional overhead. The encapsulation is done transparently at Layer 2 instead of at Layer 4, as with DLSw.

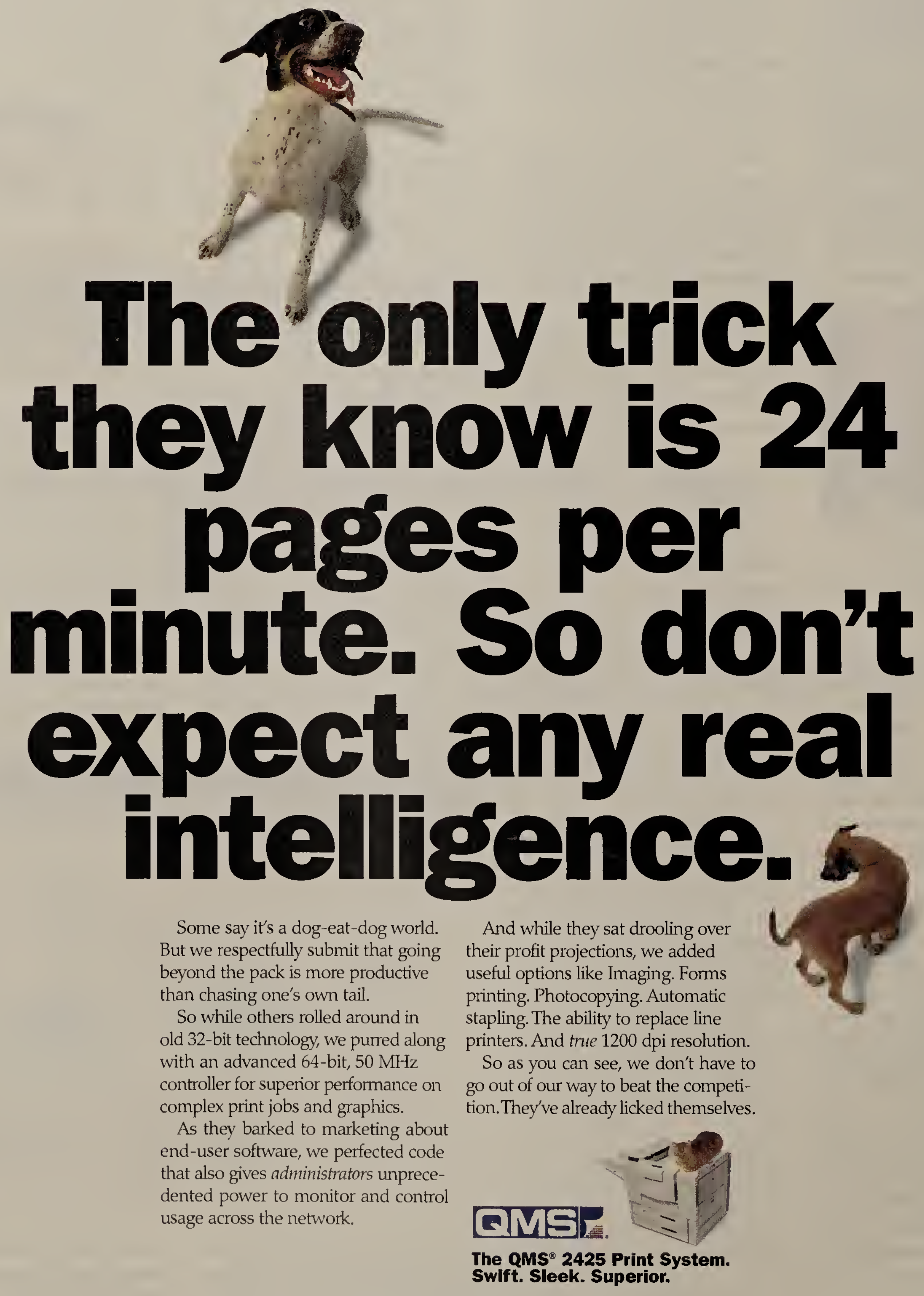
Daniel Briere and Christine Heckart

Regardless of if you choose DLSw or RFC 1490, you should select an end device that provides prioritization of SNA traffic and can shape the traffic to provide a predictable quality of service. Krautkremer stresses that the end device must be able to not only recognize a congestion notification message from the network, but also respond by throttling the SNA traffic back to the committed information rate. This ensures that SNA packets are not discarded by the net.

You can get a frame relay access device (FRAD) for as little as $1,000, but if you're operating mission-critical SNA applications, these devices will probably not offer all of the tools required for network integrity. The FRADs that can offer this will go for $2,000 to $5,000 at the remote site and $25,000 or more at the central site.

While capital budget is a concern, the real issue that drives cost of ownership is operational and WAN costs. If done correctly, the overall costs of network operation will decrease along with the monthly net bill, while application performance should improve. If you run an SNA net, this is definitely worth looking into.

Briere is president and Heckart is director of broadband with TeleChoice, Inc., a consultancy in Verona, N.J. They can be reached at danny—briere@telechoice.com or christine—heckart@telechoice.com.



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Local Networks

Covering: Operating systems • LAN management
Hubs • Switches • Adapters and other equipment

Briefs

■ **NCR Corp.** *has announced low-end single and dual* **Pentium processor-based servers** *that run a variety of operating systems, including Windows NT, NCR's brand of Unix, SCO Unix, UnixWare and NetWare. The S10XL servers support one or two 100-MHz, 133-MHz or 166-MHz (available in June) Pentium processors. The dual-processor system includes 256K bytes of write-back cache and 256M bytes of error-correcting memory. The new models also feature four EISA slots, two PCI slots and one shared slot.*

The S10XL servers are available now. A 100-MHz single-processor model starts at $6,289, and a 133-MHz dual-processor model starts at $9,189.

NCR: (800) 225-5627.

■ **The Santa Cruz Operation, Inc.** *last week introduced* **server management** *utilities for SCO OpenServer servers. One product, called SCO Doctor, is a server-based utility that monitors an SCO server and proactively suggests alternatives if a bottleneck is identified. A second product, SCO Doctor for Networks, enables companies to manage the servers remotely and also includes agents for desktop management.*

Both editions are available now. SCO Doctor is priced at $495; SCO Doctor for Networks costs $895, with the desktop option costing $495 per client.

SCO: (800) 726-8649.

■ **Storage Dimensions** *has announced a dual controller* **RAID storage system** *called the SuperFlex 5000 for Windows NT and NetWare servers. The system automatically shifts to a secondary one upon failure. It also includes hot-swappable redundant cooling fans and power supplies.*

The Windows NT model will ship this month and the NetWare version will be available in June. An entry-level configuration is priced at about $16,500.

Storage Dimensions: (408) 954-0710.

3Com mounts assault on ATM market network

By Jodi Cohen
Santa Clara, Calif.

3Com Corp. last week rounded out its Asynchronous Transfer Mode product line with switch offerings designed to meet customer needs from the desktop to the enterprise backbone.

The products include a switching engine for the Cellplex 7000 ATM backbone switch, as well as an Ethernet-to-ATM edge device and 25M bit/sec ATM gear for desktop links.

The new engine, dubbed the Cellplex 7000HD, doubles the switching capacity and port density of the Cellplex 7000. The new processor board has a 5G bit/sec backplane that supports as many as 32 155M bit/sec ATM ports. With the improvements, 3Com can pit its 7000 against Cisco Systems, Inc.'s LightStream 1010 ATM switch.

3Com's pumped-up switch is designed to aggregate departmental LAN switches and provide high-speed pipes to server farms, according to Nachman Shelef, general manager of 3Com's ATM division.

3COM'S CELLPLEX 7000HD ATM SWITCH ENGINE

- 5G bit/sec ATM backplane capacity
- Supports 32 155M bit/sec ports
- Backward-compatible with existing Cellplex 7000 chassis
- Supports signaling and LAN emulation services
- Allows current switch to support larger ATM nets

For switching at the net edge, 3Com rolled out the LANplex 2500 module for the Cellplex 7000 chassis. The module provides 16 Ethernet segments and two expansion slots for a mix of FDDI, Fast Ethernet and 155M bit/sec ATM high-speed switch connections.

John Masseria, manager of technical support at Carnival Cruise Lines in Miami, said he likes that 3Com's switch avoids problems during the segmentation and reassembly (SAR) process. "When you want to talk ATM with other switches, you've got to leave the Ethernet card, go across the backplane and then go out an ATM board. A bottleneck happens when you have too many ports trying to get [segmented and reassembled] to go out an ATM port," he said. "But 3Com has a specific SAR chip assigned to every 12 Ethernets, so no bottleneck occurs."

For the workgroup and desktop, 3Com is reselling IBM's 25M bit/sec gear, including the Cellplex 4000 12-port ATM switch, a 12-port module for the ONcore hub and ATM adapters.

The switch engine and LANplex 2500 will ship this summer; pricing has not been set. The Cellplex 4000 is available now and is priced at $7,695, while the PCI-based adapters cost $325.

©3Com: (408) 764-5000.

Novell reveals intranet suite

By Kristi Essick
San Jose, Calif.

Novell, Inc. last week introduced a corporate intranet publishing suite designed to bring the benefits of Internet technologies to NetWare customers.

Langford

The company's new InnerWeb Publisher product was announced at Internet World here in conjunction with the release of Novell's new NetWare Web Server 2.5, the core of the InnerWeb Publisher suite.

The NetWare Web Server 2.5 works as a NetWare Loadable Module and allows corporate users to convert their NetWare servers into intranet servers, eliminating many of the costs of new hardware and training, said Vic Langford, senior vice president and general manager of Novell's Internet/Intranet Services Business Unit.

The InnerWeb Publishing suite also includes Java support, Novell Directory Services (NDS) browsing capabilities and a choice of developer interfaces, including a Local Common Gateway Interface (L-CGI) extension, a Remote-CGI extension and Visual Basic, C++ or Java tools.

Other components of the suite include Netscape Navigator 2.01; the HoTMetaL Light Web authoring tool; Iware Lite to enable Web access over IPX so users do not need to install TCP/IP on each desktop; and NetWare 4.1 Runtime.

The suite will be available in June for $2,495.

©Novell: (801) 429-7000.

MORE ONLINE

Click over to Network World Fusion (http://www.nwfusion.com) for a full page of Intranet-related stories and links. Select News+ then Local Networks.

Network World Fusion

Asante rounds out switching line

By Jodi Cohen
San Jose, Calif.

Asante Technologies, Inc. last week rolled out a trio of 10M/100M bit/sec Ethernet switches that allows customers to segment LANs for increased net performance while providing a migration path to higher speed workgroups.

The products include a dual-speed switch with 10M or 100M bit/sec switching on every port and two 16-port 10M bit/sec switches with Fast Ethernet fat pipes.

Asante's switch selection

Product	Description	Pricing	Availability
Asante 5216	16-port Ethernet switch with 2 fixed 100Base-T ports	$5,595	July
Asante 5216xp	16-port Ethernet switch with 2 expansion slots for Fast Ethernet or FDDI	$6,995	July
Asante 71010xp	8 10Base-T or 100Base-T ports and 2 expansion slots for high-speed uplinks	About $750 per port	Fall

The new gear dramatically upgrades Asante's switching line, which previously comprised only the ReadySwitch 5104, a four-port Ethernet switch with one 100Base-T uplink.

The Asante 71010xp switch offers eight ports that support either 10Base-T or 100Base-T using autonegotiation on every port. The switch, which can be used in workgroup or small backbone environments, allows net managers to choose the desired mix of Ethernet and Fast Ethernet LAN segments, and transition to 100M bit/sec at their own pace. The device, which is designed to compete with Bay Networks, Inc.'s 28115 dual-speed switch, also provides two expansion slots for copper or fiber Fast Ethernet server or backbone links.

The 71010xp supports as many as 8,000 media access control (MAC) addresses. In addition, the switch supports the Spanning Tree Algorithm, which protects against path redundancy for increased net efficiency.

Asante also rolled out two segmentation switches designed to reduce traffic congestion on Ethernet LANs. The Asante 5216 offers 16 Ethernet ports with two fixed 100Base-T uplinks for server or backbone connections. The switch supports as many as 1,024 MAC addresses per port.

In addition, the device supports virtual LANs that can be defined by port, MAC address or IP address, and all nine Remote Monitoring groups. Also, the switch allows any of the 16 Ethernet ports to operate as a traffic analyzer port in order to mirror and monitor traffic on another port.

The Model 5216xp is similar in design and features, but offers two expansion slots for Fast Ethernet or FDDI uplinks.

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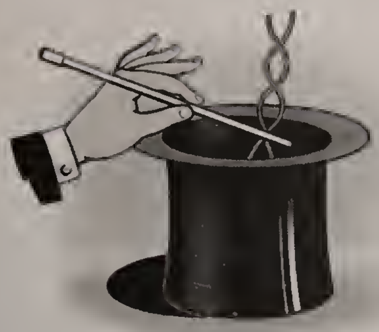

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WIRED WINDOWS

Vendors show a little LDAP'll do ya

Vendors are tripping over themselves these days to get behind the Lightweight Directory Access Protocol (LDAP) specification.

A host of companies, including Banyan Systems, Inc., IBM and Novell, Inc., recently lined up behind Netscape Communications Corp. to announce support for the directory technology. Microsoft Corp., which was left out of the Netscape party, quickly followed with its own announcement, saying it planned to incorporate LDAP in future releases of its products.

Netscape tied its LDAP support to a new product, Netscape Directory Server.

Dave Kearns

Benjamin Horowitz, senior product manager for server products at Netscape, described the new server as making it "simple for corporate users to quickly and easily create and query directories of people and information stored on corporate intranets and the Internet."

Netscape's view of LDAP is that a Web browser should be part of the solution.

Microsoft, meanwhile, said it had "been working on DAP- and LDAP-based technologies for a number of years and is a major supporter of LDAP."

Microsoft is also a supporter of the Open Directory Services Interface (ODSI), a Microsoft proposal to open up other vendors' directories, such as Novell Directory Services (NDS) and Banyan's StreetTalk. Many observers feel that ODSI is an attempt to co-opt NDS or StreetTalk, especially now that Microsoft has shelved plans for its own enterprise directory services product in the upcoming Windows NT Cairo release.

Tip of the week

Coming soon on the Internet will be the Tech Support Yellow pages, a listing of phone numbers, E-mail addresses and URLs for a host of hardware and software vendors. It will be produced by Cybermedia, the company behind First Aid 95 and First Aid 95 Deluxe (http://www.cybermedia.com/).

Microsoft implies that LDAP is simply a lookup service.

Because both Netscape and Microsoft's positions seem to be somewhat self-serving, I took a look at the IETF RFC 1777 to find out what LDAP really is.

Of course, there is no requirement for a browser — any application can be LDAP-enabled to look up directory information. And that directory information isn't limited to electronic mail addresses; it can be pretty much any information stored in an X.500-like directory. Even more surprising, LDAP is defined as a read/write protocol. It can be used to add, modify or remove information from a directory.

There also is a security model described in the document to protect your directory from unwanted intrusion. So you don't need Netscape's server (especially if you already have a NetWare or VINES server), and you certainly don't need ODSI.

LDAP is simple and clean, efficient and secure. There is room for some extension of the definition, but I hope all of the vendors involved can keep one another in check.

Of course, it's also up to you, through your contact with these vendors, to see that they deliver on the promises made. If you do, and if they do, then the year 2000 should see us able to integrate and manage directory systems from multiple vendors with a great deal of ease.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at dkearns@msn.com.

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NET RESULTS

RMON may be good, but protocol analysis still rules

Introducing new high-speed technologies and switches to your network is one thing, but managing the revised network is quite another.

Remote Monitoring (RMON) has been grabbing the attention of most net managers. A superset of the Simple Network Management Protocol, RMON helps companies make sense of the reams of SNMP data that the manageable devices on their networks generate.

That's great, but what happened to the good ol' protocol analyzer? We've heard precious little about it of late. As effective as RMON can be, it cannot provide the depth of information or functionality that an analyzer can.

Analyzers will still be required for stress-testing the network, decoding unusual protocol stacks and troubleshooting a full network outage.

The key here is that analyzers must be able to present complex data clearly and concisely. The packet data capture function should include a smart filter and alarm capability to enable users to select a specific type of decoding for each network layer. The frame-generation feature should allow simultaneous traffic generation and capture capabilities, enabling users to stress-test the network segment.

The analyzer vendors, however, need to revamp their devices as challenges from RMON providers, in particular, start to eat into this market base. The biggest knocks against analyzers are that they're difficult to use, expensive and cumbersome. To be used effectively, they require a skilled network technician. And many companies purchase a single analyzer and then ship it, along with the technician, wherever it's needed.

So the challenge for vendors is to make their protocol analyzer easier to use by incorporating more intelligence, such as smart filtering capabilities and intelligent agents. They also need to provide more intuitive graphical user interfaces for the less-technical users located at remote sites.

Many of these vendors can take their lead from Network General Corp., which is attempting to move its Sniffer line into a new era.

Network General joined in on the RMON craze by acquiring ProTools and rolling out the RMON-based Foundation Manager product. The company has also delivered the Distributed Sniffer line, which is a proprietary product with an RMON-like probe and console architecture that provides Sniffer-like functionality in a distributed LAN environment.

Skip MacAskill and Melinda Le Baron

Network General more recently announced a set of tools for monitoring switched environments, including those based on Fast Ethernet and Asynchronous Transfer Mode. Acknowledging that switched network monitoring tools will not be enough to sustain the company indefinitely, Network General also purchased AIM Technology, a supplier of Unix-based performance monitoring tools, which we expect will be integrated into Sniffer and Distributed Sniffer.

Instead of ruing the fact that technologies like RMON are threatening their traditional installed base, protocol analyzer vendors must adhere to that age-old bit of advice: Carpe diem. They must seize the day by embracing RMON and incorporating it into their product lines.

Le Baron is a research director and MacAskill a senior research analyst in Gartner Group, Inc.'s Network Computing Infrastructure group. They can be reached by E-mail at inquiry@gartner.com or by phone at (203) 316-1111.

If your visions of the future look anything like this, Networks3 is the next best thing to a good therapist.

Put your fears about the future of networking to rest at the premier event of this season: Networks3. Taking place this June 3rd–6th at the Westin Hotel in Santa Clara, the event will provide key insights into future technologies as well as opportunities to exchange ideas with peers and learn how to integrate new technologies.

Along with renowned industry speakers, the event will feature thirty-two different networking workshops as well as a Technology Solutions Lab, where network design consultants will demonstrate customized solutions to tough network challenges.

The cost of attendance is $395 per person. But if you register before May 3, you'll save $100. For more event information or to register, call **1-800-746-2185**. Or reference our web site at http://www.3com.com

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Briefs

SourceCraft, Inc. *of Burlington, Mass., this week unveiled two products for corporate developers building* **client/server intranet applications.** *ObjectCraft 2.0 is a visual development environment for applications running on both OLE and HyperText Transfer Protocol servers. The second tool set, called NetCraft, lets developers build* **Java client applications** *on Windows PCs.*

NetCraft includes a set of visual programming tools with a Java code generator. ObjectCraft 2.0 will ship June 1 for $1,995; NetCraft is free from the company's home page at http://www.sourcecraft.com.

SourceCraft: (800) 462-5328.

DNS Technologies, Inc. *of San Francisco last week began shipping SmalltalkBroker, a Smalltalk-based* **object request broker (ORB)** *based on the Common ORB Architecture 2.0 specification. Developed by DNS and Windoward Solutions, Inc., the ORB connects objects written in Smalltalk with remote C++ and Java objects that are managed by other ORBs. The software supports all Windows platforms as well as OS/2 and several Unix platforms.*

The price is $2,500 per developer, along with a $400 per-developer yearly maintenance fee.

DNS: (415) 536-1600.

Persistence Software, Inc. *of San Mateo, Calif., last week released the newest version of Persistence, software that lets* **object-oriented transaction applications** *work with relational databases. Version 3.2 adds a slew of features — such as a multithreaded object cache —that lets client applications share common objects in what the vendor calls a transaction application server. The new release also supports the Java language.*

The software is available now, priced at $7,000 per developer and $9,000 for the object server component.

Persistence: (415) 341-7733.

Data warehouses

DataMind thinks up new way to mine for data

By John Cox
Redwood City, Calif.

A few years ago, the movie *Wall Street* defined its central character, corporate raider Gordon Geckko, with a single line: "Tell me something I don't know."

Too bad DataMind Corp. was not around then because the start-up's data mining software probably could have helped.

DataMind last week unveiled software that sifts through large databases to uncover hidden trends and make predictions, according to A.J. Brown, the company's vice president of marketing.

Using the DataMind product, a typical end user can perform complex queries without having to learn how to construct the right kind of questions for the database to answer. DataMind makes use of exotic, patent-pending technology conceived by Khai Min Pham, the company's founder, chairman and chief technology officer.

The software, running on a PC or server, accesses a database via an Open Database Connectivity interface. It then creates a conceptual web, called a discovery model, that interrelates every database field and assigns probabilities as to how they affect one another.

Using a graphical wizard, users create a study, which specifies what variables they want to analyze. DataMind applies the study to the model and presents the results in Microsoft Excel-compatible spreadsheets or Microsoft Word text files.

"Developing a study is pretty easy," said Alexis de Planque, research analyst with META Group, Inc., a market research company in Stamford, Conn., and beta-test site for the DataMind Professional desktop version.

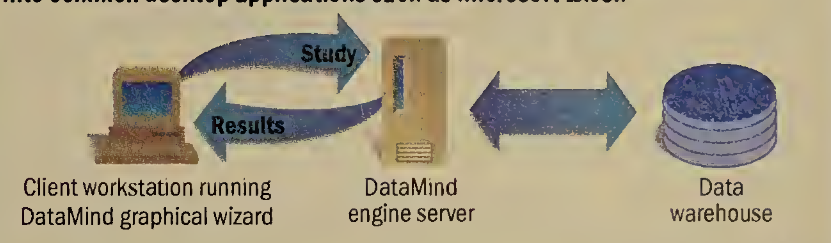
De Planque imported information from a database into DataMind and selected the input variables she wanted to explore, such as how geography affects sales. DataMind then scrutinized all the data.

For large data sets, a server version called DataMind DataCruncher is available.

De Planque said users have little opportunity to refine or customize the basic analysis performed by the DataMind software.

Data mining your own business

DataMind's graphical wizard lets an end user find data by creating a query called a study. DataMind software running on a server (or on the workstation at small sites) then sifts through the data warehouse and returns the results into common desktop applications such as Microsoft Excel.



GRAPHIC BY TERRI MITCHELL

For general business users, however, that probably will not be a drawback because they typically do not want to become technology experts anyway.

DataMind is not the only vendor trying to bring such sophisticated technology to relatively unsophisticated users, according to de Planque.

Vendors of data query tools and data warehouses are moving to add new capabilities to their tools. These offerings and desktop products such as DataMind Professional give users a low-cost, low-risk way to explore the effectiveness of data mining technology. If they strike gold, users can then move to the server-based products, according to de Planque.

DataMind Professional is available on Windows 95 and Windows 3.1, and is priced at $4,999.

DataMind Solo, a stripped-down version for small-scale data mining, costs $2,495. DataMind DataCruncher, available on Unix and Windows NT servers to handle batch processing of data mining projects, costs $25,000.

©DataMind: (415) 364-5580.

Dig into Network World Fusion (http://www.nwfusion.com) for information on:

- Data mining products from other companies
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- The latest in decision support systems

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NetworkWorld Fusion

Lotus shows off cc:Mail upgrade

Digital and ICL among companies pitching interoperability at messaging show.

By Barb Cole
Anaheim, Calif.

Despite the fact that much of the show buzz centered on the Internet, most of the products introduced here last week at the Electronic Messaging Association 96 show were aimed at making well-entrenched mail products easier to use and manage.

EMA 96 ROUNDUP

Lotus Development Corp. announced cc:Mail Release 6 and lowered its price by more than 25% compared to the previous version.

The popular mail client has a revamped database that allows administrators to keep the mail system up and running while doing mail housekeeping, according to Larry Jones, director of marketing at Lotus.

In addition, the new version has extended calendaring and scheduling features, thanks to integration with Lotus Forms and Lotus Organizer scheduling software. Available next month, cc:Mail 6 costs $55 per seat.

Separately, several companies rolled out software that helps administrators manage information and synchronize directories across heterogeneous mail systems.

Digital Equipment Corp. took the wraps off Version 3 of its X.500 Directory Services software, a product designed to let E-mail users locate end users and resources across a net.

The software now works with Web browsers and supports the Lightweight Directory Access Protocol, a subset of an X.500 specification.

The company also announced new versions of its Mailbus 400 Message Transfer Agent and Mailbus Monitor that let administrators move and monitor messages between Microsoft Exchange and heterogeneous mail systems.

In addition, Digital rolled out All-In-1 Version 3.2, which can now run on its Alpha hardware without an OpenVMS host. Version 3.2 also includes Web hooks.

Pricing for the X.500 product starts at $500 for a 500-entry directory; Mailbus 400 ranges from $2,500 to $20,000; and All-In-1 costs $12,000 for an unlimited number of users.

Meanwhile, ICL, Inc. showed off a version of its i500 Enterprise Directory Server for Windows NT and its new Web Connector for searching and updating the directory using Web browsers. The i500 directory will ship later this quarter and costs $5,000 for 2,000 entries.

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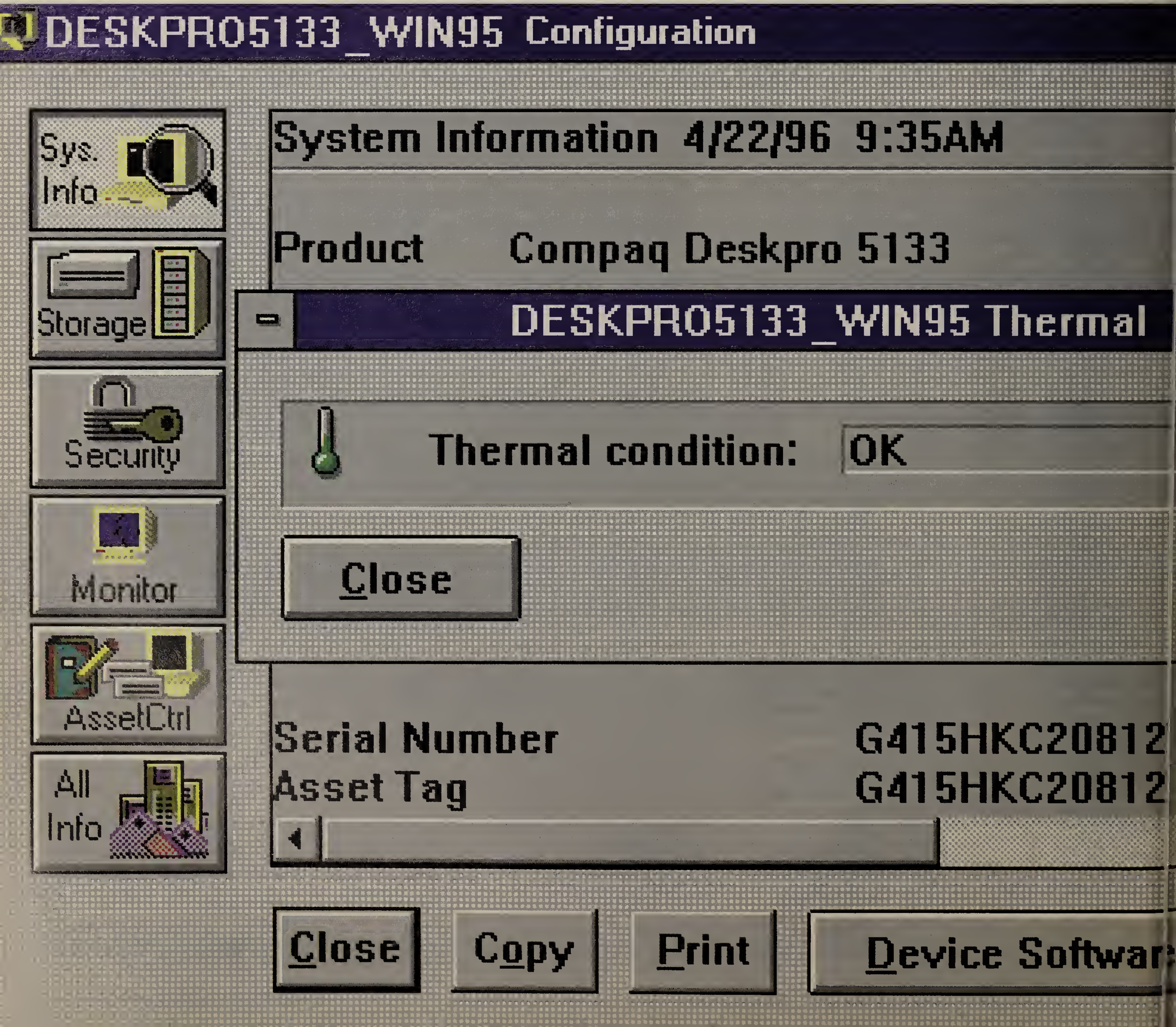

DESKPRO5133_WIN95 Configuration

System Information 4/22/96 9:35AM

Product Compaq Deskpro 5133

DESKPRO5133_WIN95 Thermal

Thermal condition: OK

Serial Number G415HKC20812

Asset Tag G415HKC20812

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SHARED LOGIC

Marc Myers

Getting object and relational data to match up

A consultant colleague of mine who specializes in object-oriented technology was recently bemoaning the state of the object programmer: “Reuse! It’s a joke. All we do is build customized frameworks to translate non-object-oriented structures.”

While I wasn’t quite sure what he was talking about, a little investigation revealed the source of his frustration: Relational database management systems and object-oriented programming systems are incompatible technologies that come from different eras.

The generation gap between object-oriented and relational data is so formidable that my colleague claims more than 70% of the time spent on most object projects involves building a compatibility layer between the two technologies.

This includes one project he just completed for U.S. Trust involving a new asset management system that provides a visual front end to a complex DB2 database on the mainframe. The project was implemented in eight months by a team of four programmers. My colleague attributes the project’s success to the thought and effort that went into building a flexible and efficient incompatibility, I mean, compatibility layer.

Is there a cure for the ills of object and relational data? Many logically propose the object database management system. Such systems utilize object structures to represent the data stored in the file systems of permanent data storage devices. This eliminates the need for a translation between relational and object structures.

While object databases mesh swimmingly with object programming systems, there is a serious problem associated with their implementation: Most database administrators don’t like them.

What is needed is a tool that will not only provide the object database interface to the ubiquitous object programming systems we use, but will also help bridge the generation gap between objects and relational data. I may have found such a tool in Fujitsu’s new ODB-II 2.0, a product that makes significant advances in the area of investment preservation for existing relational and even hierarchical data management systems.

For example, ODB-II provides a special library for the Oracle database that allows the programmer to represent Oracle as an ODB-II object. All access requests to the Oracle database then traverse the ODB-II Oracle object, which provides simplified interfaces to the programmer. Using this facility, an organization can preserve its existing Oracle investment while starting new ODB-II development.

Sounds good, but there’s one hitch: Creating multiple data storage is not a task for the fainthearted. The solution to this, not surprisingly, is to finally embrace the object database model fully.

Embracing object databases is made much easier with a tool like ODB-II because it provides technologists seeking a SQL-like programming interface with a familiar syntax known as ODQL. It also comes with a classy (no pun intended) user interface for running dynamic queries and modifying the database structures. These features will ease the transition to object technology for today’s relational specialists.

If you want more information on ODB-II, I recommend the “ODB-II Technical Overview,” available from Fujitsu’s Web site at http://www.fujitsu.com/objects.

Myers is president of Client/Server Connection, Ltd., a Cambridge, Mass., firm specializing in client/server software solutions. He can be reached at (800) 622-1108, Ext. 522, or via CompuServe at 71332,1726.

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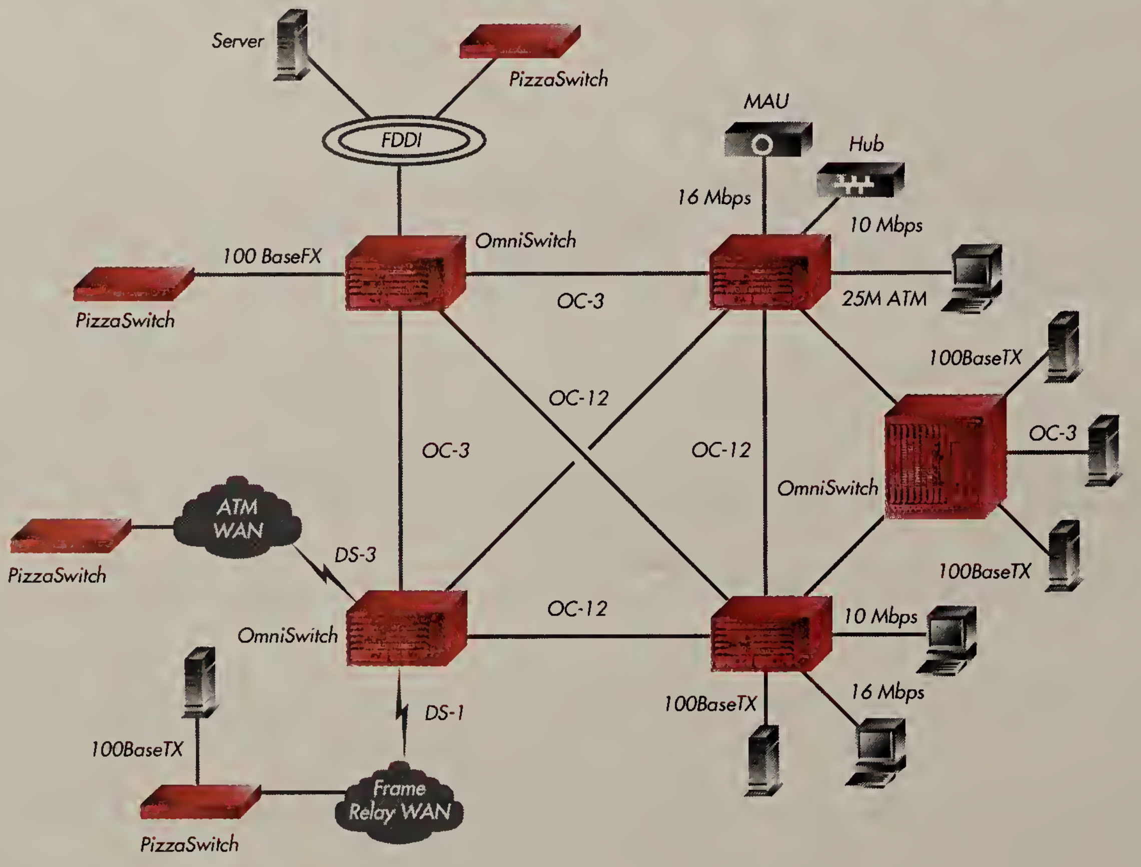

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Intranets & the 'Net

Covering: Internet Technologies and Services for Collaboration and Electronic Commerce

Briefs

■ *Growth in* **transactions on the Internet** *is driven by the fast-growing number of new buyers entering the market, users getting more comfortable on the World-Wide Web and Webmasters improving the attractiveness of their storefronts, according to International Data Corp., which last week presented some of its recent research findings at Internet World in San Jose, Calif.*

The Framingham, Mass.-based research firm expects total commerce on the Web to jump from last year's $324 million to **$189 billion** *in the year 2000.*

■ **InfoExpress, Inc.** *in Los Altos, Calif., recently launched Virtual TCP Online, middleware that reportedly allows users to nail up encrypted* **virtual private networks** *through the Internet. The client software, priced at $89 per copy, works with Windows 3.X and Windows 95. Server software is available for most versions of Unix.*

InfoExpress: http://www.infoexpress.com/tunnel.

■ **Internet online services providers** *Turner Interactive, Time Warner, Inc., Infoseek Corp. and Microsoft Corp., among others, have founded the* **Internet Advertising Council** *as a forum for a voice on industry matters.*

■ **Frontec AMT, Inc.** *of Stamford, Conn., last week announced its intelligent messaging software for* **accelerating business processes** *and routing critical information to corporate decision makers more quickly.*

The AMTrix Internet Intelligent Messaging Engine can scan and filter the content of messages processed on the Internet and World-Wide Web servers. Key information is identified, triggering other business applications or a series of alerts to company officials through electronic data interchange, electronic mail, Lotus Notes, fax, pager or voice mail.

The cost of the Web server version can vary widely, from $250,000 to $400,000, depending on a company's needs, a Frontec official said.

ActiveX pioneer pushes commerce

By Ellen Messmer

Issaquah, Wash.

Commerce Direct International, Inc. (CDI), which processes online-catalog orders for merchants, is embracing Microsoft Corp.'s new ActiveX technology.

CDI has created a software component based on ActiveX that merchants can embed in their Web catalogs to trigger network events and complete the online sales process.

ActiveX is Microsoft's Internet extension to the OLE software controls. It works a bit like Java, except that it leverages Windows programming expertise and is designed primarily for Windows client environments.

Under the CDI plan, when a customer using an ActiveX-enabled Web browser decides to order a catalog item, the CDI ActiveX control transfers the buyer off the merchant's Web site temporarily. It then connects the buyer via a private line to the CDI Electronic Commerce Service Bureau server.

After the customer types in his name, the ActiveX control in CDI's Self Serve Software starts the key exchange sequence to add the software to the browser's memory, according to CDI President Gerry Bakker. The customer need only download the private key encryption software once.

This unique key is then used to encrypt the buyer's name, address and credit card. This information is sent to the CDI server using a proprietary variable-bit packet technique.

Once received, the CDI server verifies the credit card information within seconds through private lines connected to Visa International, Inc., MasterCard International, Inc. and American Express Co. The results are communicated to the merchant using synchronous phone lines, as well.

The commerce method, which CDI is willing to license to others, is more secure than the proposed Secure Electronic Transactions (SET) standard, which calls only for the credit card itself to be ecrypted, Bakker said.

John Gould, vice president of electronic commerce at MasterCard, recently said criticisms of SET were being taken under advisement.

"People do have concerns about individuals setting up sites on the 'Net as spoof sites to collect valid credit card information," he noted.

Gould said the technical requirements for SET, as well as a programmers' guide to foster interoperability and code for SET data, should be out in mid-June.

Under SET, credit cards would be verified directly over the Internet, a substantial security risk because hackers can easily view or tamper with data, Bakker added.

CDI's *Bakker says the commerce method is more secure than the proposed SET.*

"We deserve something better than SET and RSA," Bakker said. He predicted that the Internet merchant, bank and credit card association servers based on SET will be subjected to hacker disruptions.

The CDI server also acts as the central authority on the listed product's correct price. After the customer has ordered items, the server checks the item prices against a master copy of the electronic catalog the merchant has given CDI. This price check is designed to prevent inadvertent pricing mistakes or attempted online fraud.

A handful of businesses, such as Chicago-based software company Academic Advantages, Inc., are preparing to use CDI's ActiveX controls and service bureau for sales on the Web.

But use of ActiveX on the Internet cannot take off until ActiveX-enabled browsers become more available, Bakker acknowledged.

Microsoft is expected to have ActiveX in its Explorer 3.0 browser this summer, and Netscape Communications Corp. has pledged support for ActiveX later this year, as well. Microsoft is in the process of creating ActiveX development tools. ■

Firefox gives NetWare an intranet boost

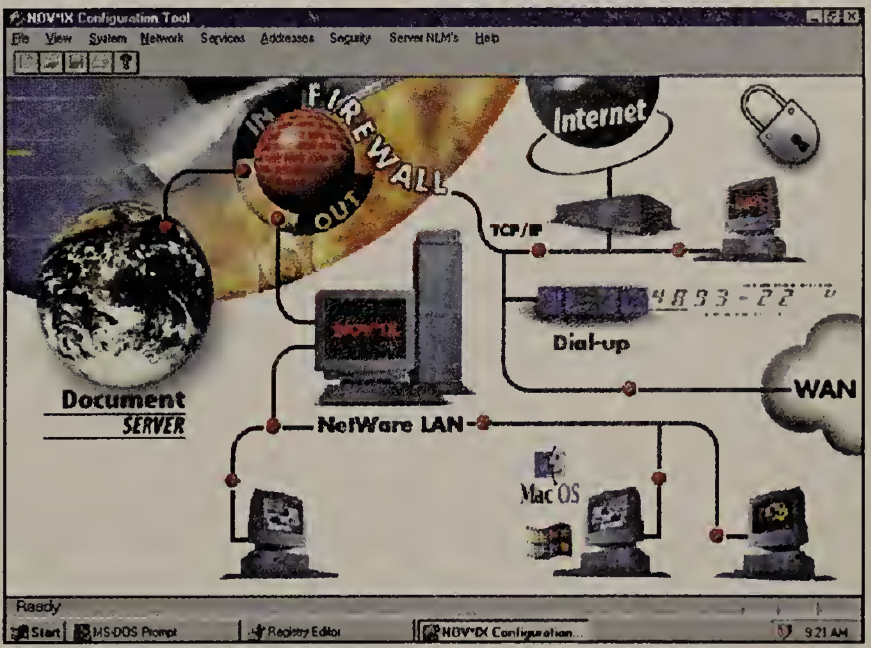
By John Robinson

San Jose, Calif.

Firefox Communications, Inc. last week introduced a new tool designed to turn NetWare into an intranet server.

Firefox's Internet Document Server, announced at Internet World here, allows companies to build secure Internet and intranet sites directly on top of NetWare.

As a result, NetWare sites can more easily establish virtual World-Wide Web and File Transfer Protocol (FTP) sites to give end users access to corporate databases and documents.



Firefox's *Internet Document Server lets companies build Web and FTP servers on NetWare, giving the network operating system secure intranet functionality.*

The Internet Document Server extends the functionality of Firefox's Novix for Internet, a NetWare-to-TCP/IP gateway.

The new product can create as many as 16 Web and FTP servers, each with its own IP address, that can reside on separate NetWare servers and communicate to a single Novix gateway over an IPX/SPX network.

From the Novix gateway, an administrator can set up Web and FTP servers for several different departments, which maintain their own documents and control user access by file name or directory.

The Internet Document Server can be accessed from both IP and IPX, and uses standard NetWare security for access authentication.

"Rather than having to keep separate access control lists, NetWare tells users if a file is usable," said John Robson, product marketing manager for Firefox. "If you wanted a secure server, you could force users to give their NetWare user IDs and passwords."

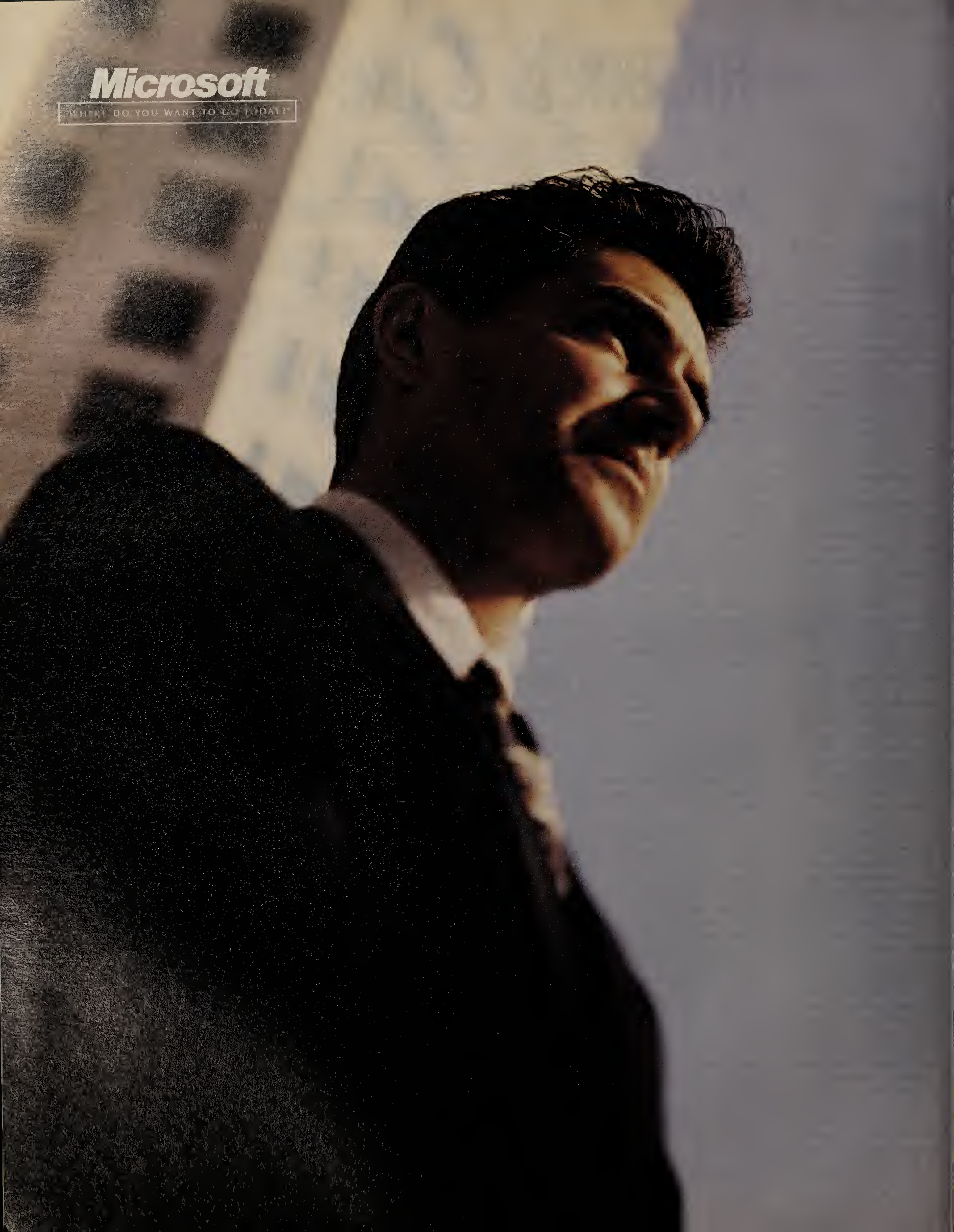
Because security is achieved with virtual servers based on IPX/SPX, IP users can be excluded by Novix for Internet's firewall.

Internet Document Server includes auditing and tracking capabilities, allowing administrators to see who is using what. The product is also customizable, supporting built-in image mapping, as well as PERL and BASIC scripting.

Firefox plans to incorporate support for FTP Software, Inc.'s KayPak document translation software, which converts documents into HTML. Support for a data wizard for retrieving information from Open Database Connectivity- and SQL-compatible databases is also planned.

The Internet Document Server will be available in July for $995.

©Firefox: (800) 230-6090.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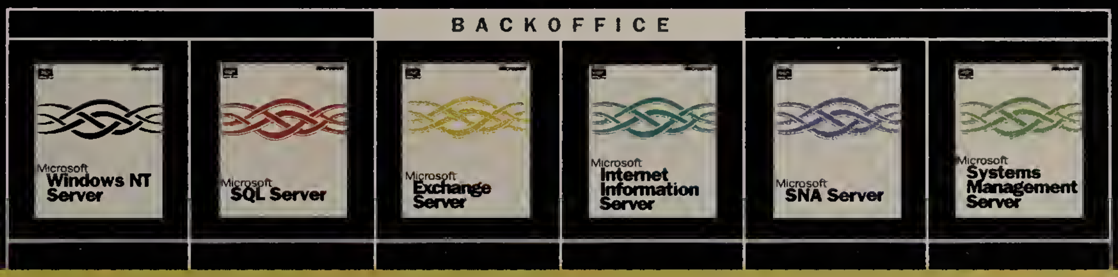
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VeriSign beats Postal Service to 'Net punch

By Ellen Messmer

Start-up VeriSign, Inc. last week said it has started issuing X.509 digital certificates for signing, verifying or encrypting messages and documents with Web browsers and Secure Multi-purpose Internet Mail Extensions (S/MIME) electronic mail.

In the future, VeriSign also intends to operate an electronic time stamp service that will place a digital seal on documents to prove which parties signed it and that its contents had not been modified.

In these two ventures, VeriSign, a spin-off of RSA Data Security, Inc., faces competition from the U.S. Postal Service (USPS), which also plans to operate as a certificate authority and electronic time stamp service.

The USPS, with 40,000 post offices nationwide, is getting into the business using the same RSA public key technology.

In the area of digital certificates, which bind a user's identity to a unique public key pair, VeriSign is faster out of the gate than the USPS, which will not start its service until year-end.

VeriSign's X.509 certificates work with Netscape Communications Corp.'s Navigator 3.0 browser, now in beta, and S/MIME packages from Frontier Technologies, Inc. and ConnectSoft, Inc., among others.

Hank Vigil, electronic commerce and security business unit manager for Microsoft Corp., last week said his company will be supporting VeriSign digital IDs in its Internet Information Server and ActiveX Controls.

According to Netscape Vice President of Technology Marc Andreessen, the Class 1 Digital ID he got from VeriSign was just as good a proof of identity on the Internet as a driver's license or passport.

But that may have been hyberbole. VeriSign this summer will begin issuing higher assurance certificates, Classes 2 through 4, that will require notarization procedures, personal presence and even investigation before issuance, said Marshall Behling, VeriSign's business development manager.

VeriSign's *Behling says higher assurance certificates will be issued this summer.*

Although the USPS is slower than VeriSign as far as the digital certificate business is concerned, it may be ahead in setting up an electronic time stamp service.

The USPS plans to begin operating a "postmarking server" this July that will time stamp electronic documents with the USPS digital seal. Each USPS electronic postmark will cost 10 cents, and online billing will be available.

"This postmark will show the document existed at a certain point in time and hasn't been modified," said Paul Raines, program manager for the Postal Electronic Commerce Services. "The postmark provides protection under the USPS fraud statute, and if it's used to perpetrate fraud, we'll investigate it."

The electronic postmark service, to be provided via dial-up, the Web, Internet mail or an X.400 gateway, is expected to be available at 95 metropolitan-area business centers. The USPS will also archive electronic documents in the future.

Although VeriSign also plans to do electronic time stamping, USPS fraud statutes will not apply to postmarked documents. However, the U.S. wire fraud statutes do apply to any document sent electronically, VeriSign attorney Michael Baum pointed out. ■

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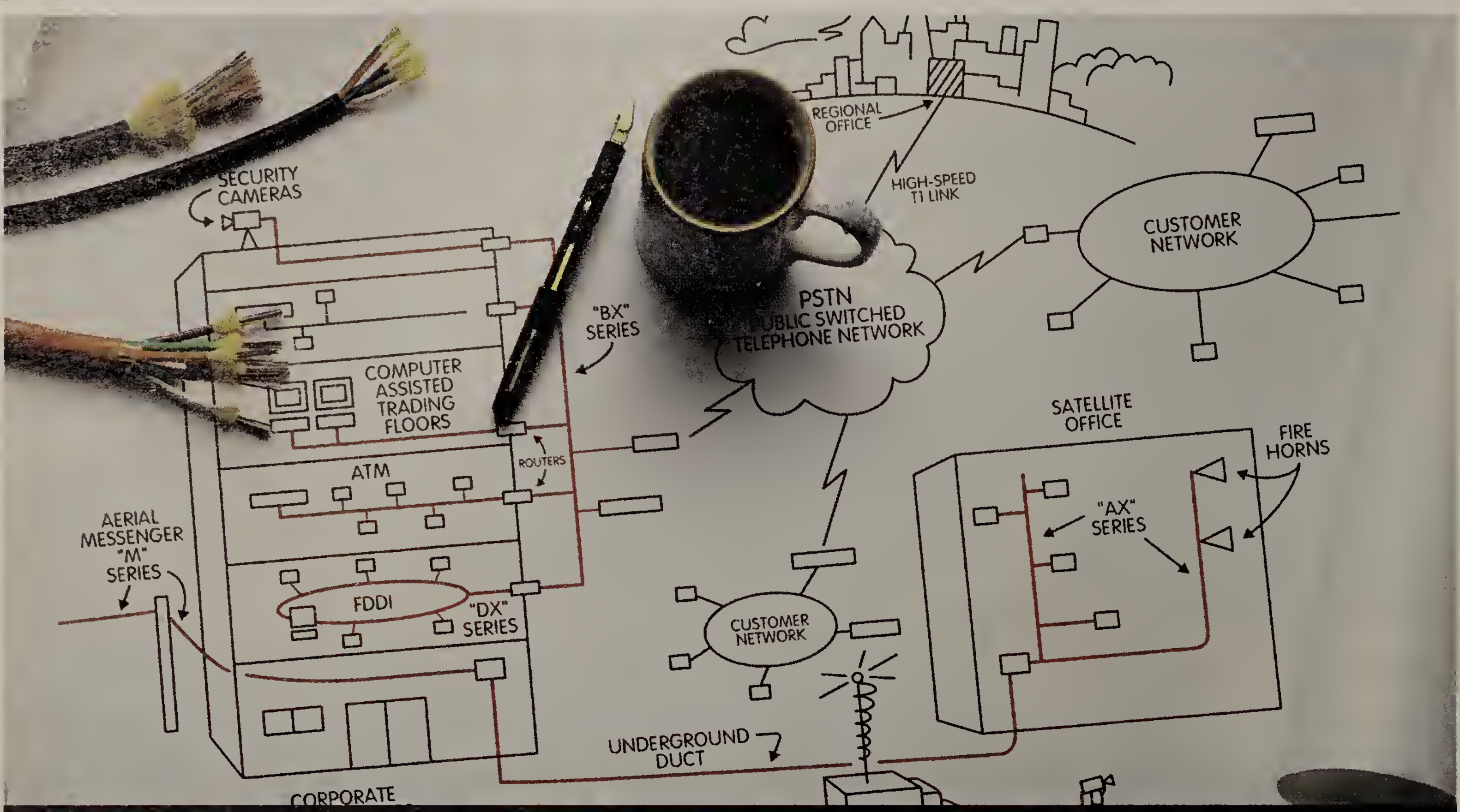

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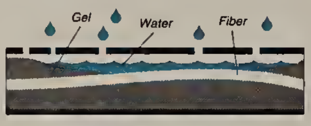

Gel-filled cables leave delicate optical fibers exposed to the damaging effects of water.

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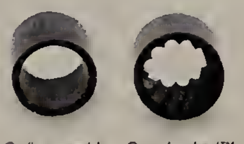
Unlike the standard sleeve-type cable jacket, our Core-Locked™ jacket is extruded under high pressure over the cable's core. This provides 25% more jacket material for enhanced strength, and prevents slippage and jacket damage during installation.



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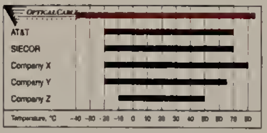

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NETWORK HELP DESK

Network World *tracks down answers to your questions. Please submit them to Chris Nerney via phone at (800) 622-1108, Ext. 451, the Internet at cnerney@nww.com, or fax at (508) 820-1103.*

What do you do when you have two TCP/IP networks on the same physical medium? I have connected two Unix machines, one via a cable TV bridge, to a Banyan Systems, Inc. VINES LAN over the same wires. Clients only needed connectivity to one of the hosts, and they all ran VINES smoothly. Now I need all PCs to get to both hosts. How do I do this?

Via the Internet

Assuming you're working with VINES 5.X servers and DOS/Windows 3.X clients, three likely options stand out, says Jim Fralix, a consultant with Banyan of Westborough, Mass.

The first option is to install a second network interface card in the VINES server and segment the networks by connecting the local net to one of the server interfaces and the cable TV bridge to the other. The VINES server would need the TCP/IP routing option and a TCP/IP address for the interfaces on each network. The clients would use the VINES server's IP address on their local network as their default gateway.

The drawback to this approach is an increased load on the VINES server. However, the impact would likely be offset by the effect of segmenting the network traffic.

The second option is to leave the physical topology as is but add an IP router to the network. It would have to provide the functionality of separate IP networks on the same wire. Clients would use the IP router as their default gateway.

On the downside, this approach does not result in network segmentation.

For the third option, segment the networks at the cable TV bridge. The IP router would need two network interfaces, one to connect to the local net and one to the bridge. Again, the clients would use the IP router as their default gateway.

If you have VINES clients on both networks, the IP router would need to act as a VINES routing server for any network that does not have a VINES server.

This approach is rather complex and can be expensive.

How to size frame relay access for interconnecting local nets

A back-to-the-basics look at how to ensure you get the most out of a frame relay network.

ONLINE

Find out more about frame relay on Network World Fusion. Select NetRef, Technology Resources then Broadband Networks.

http://www.nwfusion.com

By Robert Lieberman and Peter Szoke

Frame relay has taken North America by storm, and forecasters project its use to double in 1996. Much of this growth will come from interconnecting LANs over the wide area.

Why? Public frame relay prices are well suited for bursty LAN/WAN transactions such as client/server queries or file transfers. Depending on the network locations, topology and traffic patterns, frame relay can actually cost as little as half the price of a comparable leased-line setup. But how do people really size their frame relay network access? The options range from consulting a psychic to using rules of thumb — in other words, most people do not use any systematic method. This results in ordering either too little bandwidth (a potentially career-threatening move) or, more commonly, ordering and paying for too much bandwidth.

The basics

Frame relay carriers have different pricing structures, but four elements are consistent across providers. They are:

- Digital access from your location to the carrier.
- Port or connection speed, which is the maximum throughput into the frame relay network.
- Committed information rate (CIR), which is the guaranteed throughput into the frame relay network. Data can burst above the CIR if capacity is available across the wide area.
- Usage in terms of bytes sent across the network.

An application's effective bandwidth will vary based on port speed, CIR and traffic load at any instant on the carrier's network. The carrier makes a commitment to provide at least the bandwidth of the CIR. And the carrier delivers in excess of 99.9% of the data that is within the CIR.

You can choose a port speed greater than the CIR. If so, the application can burst at the port speed. However, if the network is congested, the carrier makes no guarantee that the traffic beyond the CIR will be delivered. You have to weigh the benefits of adjusting the CIR one way and port speed the other with price and performance.

If your LANs are interconnected with leased lines, how do you determine the cost/performance trade-offs with frame relay?

Step by step

First, ascertain the present inter-LAN traffic. LAN/WAN probes will help measure this. Some probes are proprietary, while a number of others comply with the Remote Monitoring Management Information Base.

It is wise to take measurements during different times of the day to get an impression of the traffic profile. Furthermore, this will help determine where the network delays are today: within the client, server or router processors, or during transmission.

Next, speak with the users. Most assuredly, they all will say they want faster response times.

After some discussion, you should be able to assess how they weigh response time vs. cost. Users also may be able to provide a sense of how their network traffic will change over the next year.

If they're going to start running a major new application, you probably should take this into consideration when picking the CIR and port speed.

Model perfect

Now you are ready to model the network. For the WAN, you will need to develop a model based on a network of queues. A course in stochastic processes would be quite helpful. For the LAN side, a model based on discrete time analysis would come in handy. Be prepared for some serious math!

For the less masochistic and more practical, many good modeling and simulation tools are available.

With a modeling tool, you can quickly assess the trade-offs between response times and port speed/CIR for the network. Several packages may be worth considering.

The next step is to price out the various options. Telephone carriers can provide pricing for leased line vs. several frame relay scenarios, and it's advisable to get quotes from more than one carrier. A more convenient option is to use a network pricing tool to interpret the tariffs.

By following these steps, you will have much of the information for your business plan.

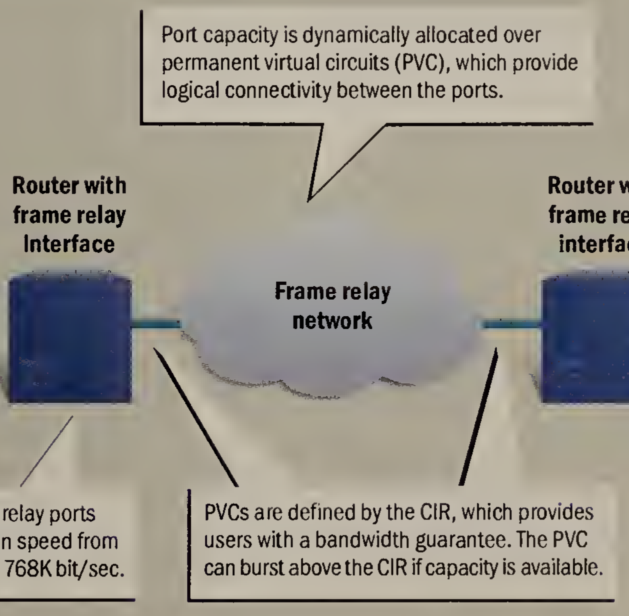
You will also have a network design that ensures good network performance for your users, while still maintaining your popularity with the company controller.

UP CLOSE

Sizing frame relay nets

Frame relay performance will vary based on the port speed, the committed information rate (CIR) and the carrier's traffic load. To size the net for your applications:

- ▶ Ascertain present inter-LAN traffic using probes to take measurements at different times of the day.
- ▶ Use a modeling tool to assess the trade-offs between response times and port speed/CIR.
- ▶ Price out various carrier options, looking at leased-line costs and several frame relay scenarios.


Router with frame relay interface
Frame relay network
Router with frame relay interface

Port capacity is dynamically allocated over permanent virtual circuits (PVC), which provide logical connectivity between the ports.

Frame relay ports range in speed from 56K to 768K bit/sec.

PVCs are defined by the CIR, which provides users with a bandwidth guarantee. The PVC can burst above the CIR if capacity is available.

Lieberman is senior scientist and Szoke is sales director at Network Design and Analysis Corp., a Toronto-based company that develops and markets a family of performance-modeling, circuit-pricing and wide-area network design tools. They can be contacted by phone at (905) 477-9534 or via the Internet at nda@ndacorp.com.

Need information?

Let *Network World* provide a quick primer on an important or emerging technology. If you have an idea for Technology Update, contact Beth Schultz by phone at (312) 283-0213 or via the Internet at bschultz@nww.com.

EDITORIAL INSIGHTS

Tales from the Darkside

This week's issue contains a couple of stories that should chill the blood of any enterprise network manager.

One involves a malevolent darkside hacker who, victims say, has made their lives quite unpleasant. The piece offers a scary look at just what happens when you run afoul of this sort of character, and why investing in security isn't a luxury in this networked world.

As scary as the prospect of a random encounter with the darkside is, you're more likely to be upset about our story showing service prices rising in the wake of telecom reform.

"Hold on," you say. "Telecom reform was supposed to increase competition, deliver new services and lower prices." Well, that's the theory. But, as we've reported before, the benefits of telecom reform may be a long time in coming. Sure, reform will ultimately produce all sorts of new, high-bandwidth services, new competitors in the local, long-haul and Internet access markets, and *lower prices.*

But the industry will first go through a massive restructuring that will create in-flight turbulence for us passengers.

One prominent sign of this restructuring is the mergers taking place among carriers, such as Pacific Telesis and SBC, and NYNEX/Bell Atlantic. Mergers of that magnitude involve painful choices, such as which services will be killed and how many workers will go. NYNEX/Bell Atlantic will lay off 3,000 workers, on top of a NYNEX program aimed at gutting 17,000 jobs. That raises real concerns about service quality.

Even without mergers, carriers will be reorganizing, chopping services — a la AT&T's Network Notes — and trimming their staffs. They'll sometimes market new services before their engineers or their networks are ready to support the offerings. They'll jump from partner to partner in pursuit of real or imagined gains. Scary, huh?

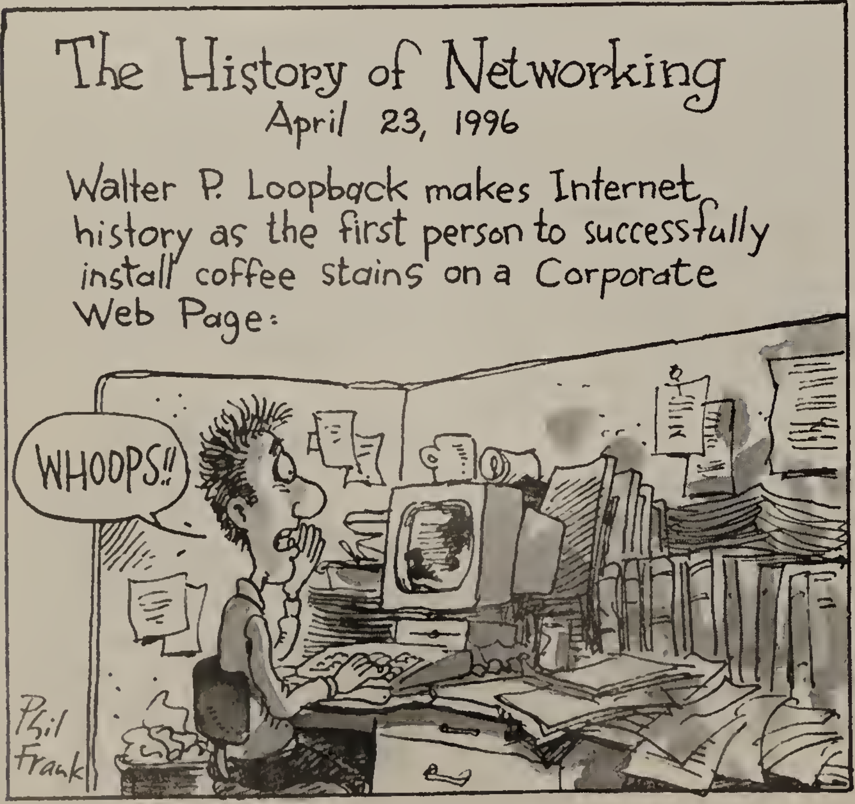
But you can protect yourself during this topsy-turvy phase of reform by driving competition from the bottom up. Demand quality service and escalate complaints quickly if problems crop up. Know what rivals offer and jump ship if you're unhappy. Play companies off one another and avoid single-vendor deals.

In short, don't be a quiet customer who unhappily funds a carrier's marketing extravaganza and forays into new markets.

John Gallant, editor in chief jgallant@nww.com

Teletoons

By Phil Frank and Joe Troise
guru@well.com


The History of Networking
April 23, 1996
Walter P. Loopback makes Internet history as the first person to successfully install coffee stains on a Corporate Web Page:
WHOOPS!!
Phil Frank

THE BLUE VIEW

Networking deals highlight vendors' desire to address both private and public nets

Anura Gurugé

It was not a coincidence that Cisco Systems, Inc.'s proposed acquisition of StrataCom, Inc. hit the news exactly one month after IBM announced it was reselling Cascade Communications Corp.'s frame relay and ATM switches.

Although these two deals are fundamentally different, with one an outright purchase and the other a product and technology OEM arrangement, both IBM and Cisco are pursuing the same goal: They want to control the future of commercial-sector networking, either in the form of private intranets or carrier-provided public nets. Whether either of them will succeed, and the potential ramifications to users, is now the $64,000 question.

To meet their data access and interchange needs, today's enterprises must rely on a private intranet, a public network or a hybrid of the two. Theoretically, a networking vendor that has clout in both private and public networking has a better chance of succeeding than one that is a player in only one area or the other. Users must weigh the cost of running a private intranet against surrendering some control by using a public frame relay or ATM network. It will be interesting to see what criteria IBM and Cisco use to steer users toward one or the other of these approaches, given that the two vendors essentially will be straddling both sides of the fence.

Users must weigh the cost of running a private intranet against surrendering some control by using a public frame relay or ATM network.

For users, the implications of these deals are, unfortunately, going to be double-edged. Competition is always good and will continue to result in better offerings, prices and services. But the current market consolidation reduces the number of competing players. There is also the possibility that vendors and carriers will form a formidable axis that could dilute some of the beneficial aspects of today's cutthroat competition.

Until now, it is fair to say that no one company has had significant presence in both private and public networking — although StrataCom is active in both arenas, it is better known for its successes in public networking. IBM's SNA-based networking prowess, until now, has been entirely restricted to private networks, as has Cisco's, though Cisco routers are heavily used in carriers' internal networks as well as in network integration and outsourcing applications.

A major tenet of IBM's original ATM strategy was to provide ATM and, in the interim, frame relay switches to carriers. The high-capacity IBM 2220 Models 700 and 800 were squarely targeted at this market. These models have now been usurped by Cascade switches.

While IBM courts carriers with Cascade switches, Cisco will try to head off Big Blue using StrataCom switches and, possibly in some instances, its own LightStream family. Trying to woo this carrier market, however, is not going to be easy for IBM or Cisco.

The biggest impediment is that carriers are likely to perceive them as competitors. IBM and Cisco are active and vociferous proponents of private networks. Carriers understandably are not overjoyed by the prospect of flourishing private frame relay and ATM networks that will cut into the expected use of their public services. Furthermore, now that StrataCom and Cascade, the leading vendors of public network switches, have joined forces with Cisco and IBM, respectively, the carriers suddenly face the prospect of sleeping with the enemy.

Then there is Advantis. In a sense, IBM's involvement in Advantis is even worse than its endorsement of private networks. As a provider of bandwidth, value-added networking and systems integration, Advantis is a direct, head-to-head competitor with carriers worldwide. This could lead to an interesting dichotomy.

Cascade, at least as yet, can deal directly with carriers independent of IBM. Moreover, it is no stranger to the carrier market. Carriers have enough clout, resources and ego to feel that they do not need IBM as an intermediary if they want to obtain Cascade switches. They will have no compunction about dealing directly with Cascade.

This would obviously not help IBM in its goal to penetrate the carrier market. Given that IBM is totally committed to pursuing this market, especially now that Cisco has entered the scene, we can only wait with bated breath for IBM's next move.

Acquiring Cascade would be the next logical step, but such a deal is likely to exceed even the staggering $4 billion Cisco paid for StrataCom. Having spent $3.7 billion for Lotus Development Corp., with the return on this investment still being open to debate, Louis Gerstner might be leery of another networking mega-deal — even if access to the public networks are at stake. IBM may be forced to opt for a less expensive and potentially less potent solution.

It is also likely that players such as Bay Networks, Inc., 3Com Corp. and Xylan Corp. are not going to wait quietly on the sidelines while IBM and Cisco try to carve up the whole market. There will certainly be other deals and partnerships.

The bottom line is that the whole complexion of contemporary networking is changing. There will no longer be a clear distinction between vendors that promote intranets and those that concentrate on public nets. With frame relay, there has been a growing trend toward public net usage. Because ATM networks are likely to carry data, voice and video, users may prefer their own private nets.

Gurugé is an independent consultant specializing in internetworking and IBM network architectures. He can be reached at (603) 878-1303 or via the Internet at aguruge@mcimail.com. His new book Reengineering IBM Networks *will be available from John Wiley & Sons in June.*

ATM STANDARDS

The Anchorage Accord promises to stabilize ATM

Mary Petrosky

As Zorba the Greek knew after eating his thousandth cherry, you can have too much of a good thing. Fortunately, the ATM Forum has come to the same conclusion. By adopting the Anchorage Accord at its mid-April meeting, the forum is giving ATM vendors and customers a respite from the banquet of specifications it is constantly replenishing.

Since its founding in 1991, the ATM Forum has approved nearly 50 specifications. An additional 20 are due to be completed by the end of the summer, and dozens more are in progress. Although the ATM Forum is to be congratulated for its prodigious output, the market has been unable to absorb all the technology being dished out.

Vendors have sometimes hesitated to commit development resources because they knew another revision of a specification was coming. Potential customers have faced a similar conundrum, wondering whether to base their ATM deployment on the current version of a specification or wait for the next one. Worse yet, prior to the Anchorage Accord, the ATM Forum had no stated policy that new specifications had to be backward-compatible with earlier versions. The result is that Version 3.1 of the User-to-Network Interface (UNI) is not backward-compatible with UNI 3.0, despite what's implied by the minor change in revision number.

The Anchorage Accord will give the ATM market a basis for stability. But it won't guarantee that vendors will support standards in a timely fashion.

The Anchorage Accord addresses the issue of technology overload by identifying two broad categories of specifications: foundation and expanded feature. The foundation will define a baseline of capabilities that vendors should implement and customers should expect to be supported. Expanded-feature specifications build on the foundation and provide services, such as voice and video support.

Once nailed down, the foundation shouldn't change for 18 months or more, giving vendors and customers some digestion time between revisions. The accord also commits the forum to ensuring that new versions of specifications are backward-compatible and interoperable with existing ones, heading off the need for forklift upgrades.

The Anchorage Accord represents a milestone in ATM's maturity. The foundation will define a baseline of capabilities that vendors should implement and customers should expect to be supported. The accord will also help bound the ATM Forum's ongoing work, so vendors can get down to building products and network managers can buy ATM gear without fear it could become obsolete.

However, the Anchorage Accord won't give instant stability to the ATM market. Forum members still need to sort out which specifications will fall into which of the two categories. They've agreed that the foundation will include core LAN and WAN ATM specifications, such as UNI signaling, the Private Network-Node Interface (P-NNI), the Broadband Inter-Carrier Interface (B-ICI), traffic management and key physical layer interfaces. The expanded-feature specifications will include LAN emulation, circuit emulation, audiovisual multimedia service, and voice over ATM.

The foundation won't be fully defined until early next year, and compliant products won't be available until 6 to 12 months later. Many ATM specifications are interdependent, and a change in one requires a change in others.

Once defined, the foundation shouldn't change without good reason. Exceptions would be made, for example, for addendums, which could be issued to address implementers' problems, or to ensure the ATM Forum is in step with standards organizations such as the Internet Engineering Task Force.

Organizations that use ATM or intend to implement it before year-end should plan to migrate to the foundation. The migration could be painful and costly for some. For example, many switches will require a hardware upgrade in order to support the recently approved rate-based traffic management scheme, which will become part of the foundation under the Anchorage Accord. Be sure to find out what your vendor's upgrade plan is.

The Anchorage Accord will give the ATM market a basis for stability. However, it won't guarantee that vendors will support standards in a timely fashion. Although UNI 3.1 was finalized in September 1994 and UNI 3.0 a year before that, both Cisco Systems, Inc. and Fore Systems, Inc. only recently announced support for them.

Organizations that want standards-based ATM products need to tell their vendors and vote with their pocketbooks, if necessary. Likewise, you should let the ATM Forum know what you think of the Anchorage Accord. You can send feedback to the forum at info@atmforum.com or call the forum office at (415) 949-6700.

Petrosky is a senior analyst with The Burton Group, which focuses on network computing technology and architectures. She can be reached in her San Mateo, Calif., office at (415) 572-0560 or via the Internet at petrosky@tbg.com.

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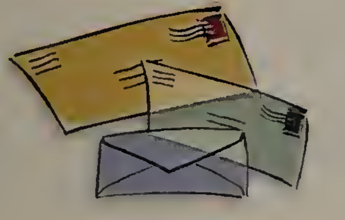

Motorola responds

We regret that your recent article concerning Motorola's experience with Cisco Systems, Inc. routers was imprecise in describing the domain and context of the person who provided this unauthorized interview (April 1, page 1). The individual in question has responsibility for only one of our many worldwide sites, but the frequent reference to Motorola in your article implied a much broader scope, creating the impression of a widespread issue — which is inaccurate.

It is important to point out that the comments made are not applicable beyond the local-area network — only in our Austin, Texas, facilities — and, regrettably, the individual interviewed strayed much too far into the realm of personal opinion and speculation. It is certainly not representative of our overall positive experience with Cisco at our many locations worldwide.

Cisco is a highly valued vendor to both Motorola as a corporation and to the Semiconductor Products Sector. We have established a very extensive and high-performance global network based on Cisco's routers. We have developed jointly with Cisco unique arrangements for support and service, which are particularly important to us internationally. The reliablility and functionality provided by Cisco's products have led us to use their routers exclusively in our wide-area network.

We have enjoyed a long partnership with Cisco in growing our Semiconductor Products Sector's network. We have shared our requirements and knowledge with Cisco reciprocally for a number of years and are currently working with their engineers on other projects; for instance, ISDN security and functionality.

Thank you for the opportunity to clarify Motorola's relationship with one of our finest vendors. Cisco has been and will continue to be an integral part of our worldwide networking architecture.

Patrick Horrigan
Corporate vice president and director
SPS Information Systems and Corporate
Computing Services
Motorola, Inc.
Tempe, Ariz.

Editor's reply: Our use of the Motorola name on the second and subsequent references to the

See **Message queue,** *page 48*

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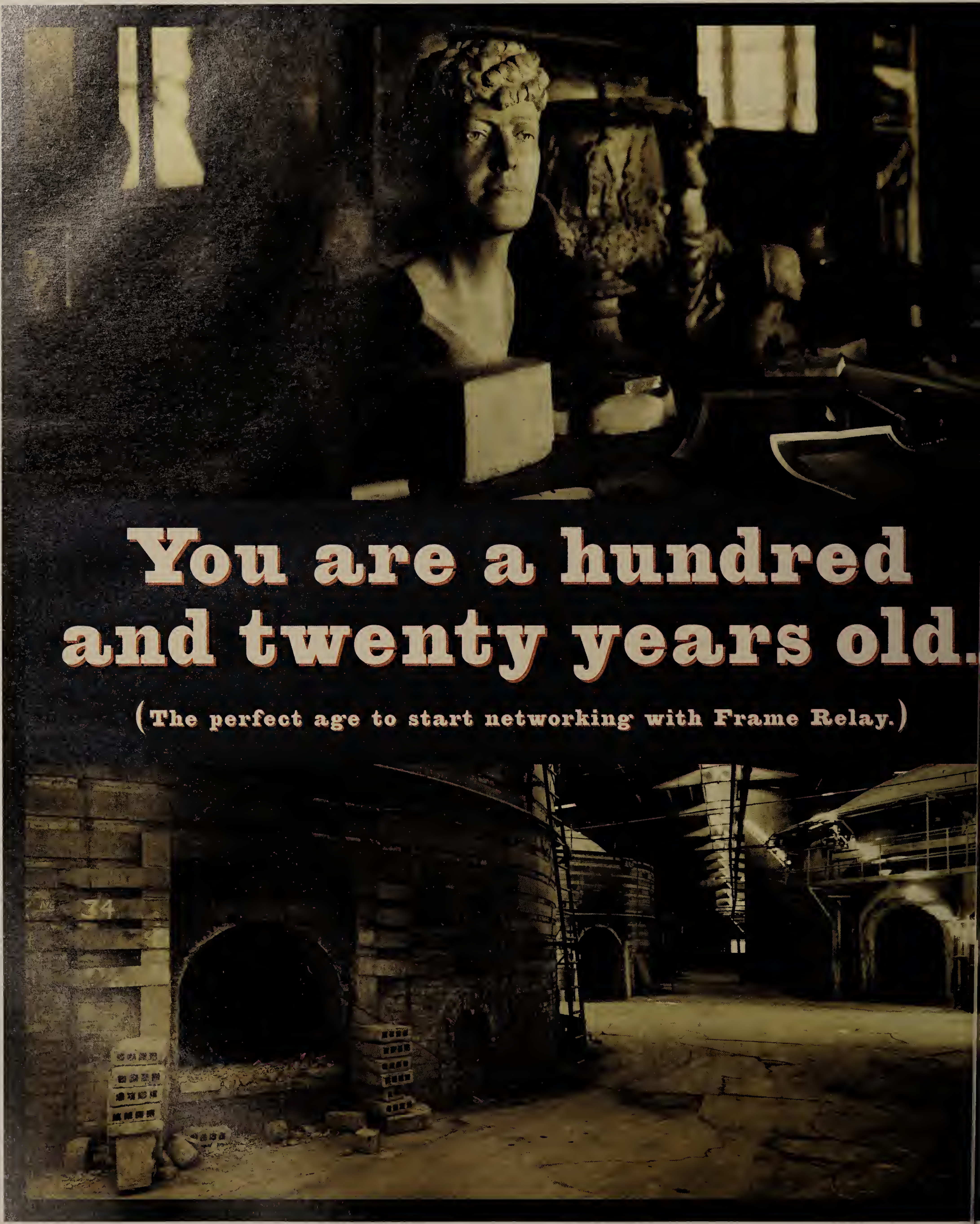
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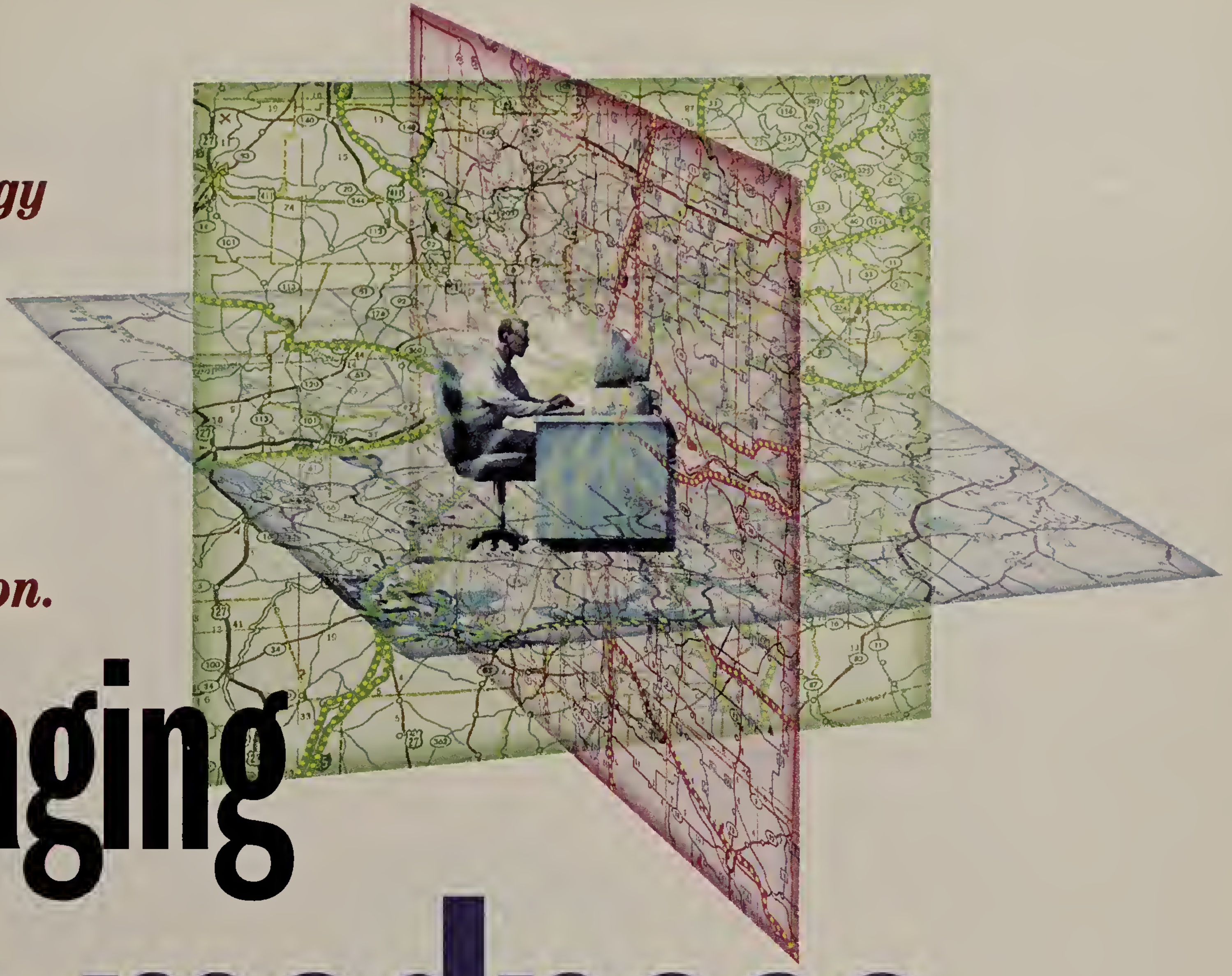
Feature

Web technology presents yet another net management challenge. Here's how to meet it head-on.



Managing Web madness

By Mark Gibbs

If your organization has a Web site (and it is a rare one that doesn't these days), you have probably noticed by now that along with its many benefits come a number of problems that conspire to create some management challenges — a polite way of saying that you have another pain in the net to deal with.

The challenges apply whether your Web site is used on the Internet or an intranet. There are basic diagnostic and connectivity issues to deal with, along with security and the integration of Internet and intranet sites. Simply building the beast takes some management skills, given all the documents to track, as does monitoring who is visiting your site, how often and for what reason.

So where do you begin to get a handle on this immature, rapidly changing set of technologies? The answer is to develop an in-depth understanding of what you need your Web servers to do and in what context they have to operate.

Web communications management

Your first priority should be to create a secure and manageable communications environment for your Web site, which can get tricky. This is an issue that is frequently overlooked, even though it provides the foundation for a reliable, commercial-grade Web service.

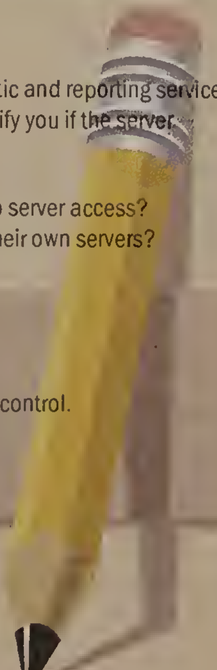
An old staple for providing basic diagnostics and connectivity assurance in this area is the Simple Network Management Protocol. SNMP can tell you if the server is actually running, provide performance data, log server error conditions and report failures.

A Web server with built-in SNMP support can be integrated into any SNMP management system you run, provided that system allows you to specify new Management Information Bases — the control structures for SNMP.

Unfortunately, only a few Web servers — specifically Microsoft Corp.'s Internet Information Server, Netscape Communications Corp.'s Enterprise Server and Informationsvavarna AB's Spinner — have built-in SNMP support.

While you can still get performance data without SNMP support, monitoring server failures and error conditions is difficult. For alerts, you

WEB MANAGEMENT CHECKLIST



Basic Communications

✓ Do you need SNMP support at the Web server or does the product offer similar or better diagnostic and reporting services?
✓ Do you have a network management system, ideally integrated with the Web server, that can notify you if the server platform fails? (A must for high-reliability service.)
✓ Do you need a firewall? (Highly advisable if your intranet is to be connected to the Internet.)
✓ Can your internal and external network connections support the projected load attributed to Web server access?
✓ Will you have only one Web server, or will you allow departments and/or individuals to operate their own servers?
✓ Do you need support for multihoming?

Web Server Selection

Does the Web server support the following?
✓ Channel security – SSL, S-HTTP or, in the near future, Microsoft's PCT.
✓ Authentication – the ability to validate users at a more reliable level than user name-password control.
✓ User and group access control down to the directory and/or document level.
✓ Multiple levels of activity logging.
✓ Remote configuration and administration.

Corporate Issues

✓ Do you have the right level of management buy-in?
✓ Who is responsible for Web content internally and externally?
✓ Who is funding the Web system on an ongoing basis?
✓ What standards will you enforce for Web page design internally and externally?
✓ Will the organization have a standard browser, or can you tolerate a browser free-for-all?

will be pretty much forced to cobble together a makeshift solution, perhaps by programming a continuous ping of the Web server or by writing your own application that interrogates it. Many Internet service providers have taken this route, and there are many high-performance Web sites that rely on a good "hack" to keep them running. Otherwise, you will have to live with the fact that you won't know something is wrong until someone complains.

Building the beast

The actual construction of the Web site contents gives rise to two problems. First, most organizations don't know exactly what to do with their Web site. This is usually because they do not have corporate buy-in at the right level. The consequence is that ownership and control issues aren't resolved, and the Web site ultimately languishes and becomes stale. Curing that is a political issue that must be addressed at the management level.

The second problem is the scale of the task. A reasonable corporate Web site might involve more than 100 documents. Managing that number of interlinked documents along with associated external data is not easy, and tools that help in this area are still uncommon.

One of the most sophisticated is Microsoft's FrontPage, currently available free for beta test. FrontPage is a Web page editor that includes a feature for examining your Web architecture and checking both on- and off-site links. This allows you to see if links actually work. (There is little that makes a site look as bad as links that lead nowhere.)

WHAT DO I NEED?

Your Web management toolbox should include:

- Web mapping tools to examine links both off- and on-site.
- Web server log analysis tools.
- Remote Web content updating system.
- Interserver Web document replication services.

Web maintenance can be done with tools built in to O'Reilly & Associates, Inc.'s WebSite and Netscape's servers. And there are many editing tools worth checking out, including SoftQuad, Inc.'s HotMetal Pro and Netscape's Netscape Gold. Watch for graphical Web page management tools appearing over the next few months to rival FrontPage. But at present, FrontPage is arguably the best Web page construction and maintenance tool available, as it combines both functions in a seamless fashion.

Secure Webs

For both public Internet and private intranet servers, the key communications issue is controlling access to the server. While most servers offer user and password-based, as well as group membership access control, this is rarely adequate.

To achieve an industrial-grade management solution, the first line of control must be a firewall. Firewalls are systems that can filter and, if required, block packets based on the protocol being used, network addresses and other criteria.

Firewalls come in many configurations. It might be external to the Web server, such as Secure Computing, Inc.'s Sidewinder, which comes bundled with its own hardware.

There's also add-on software that runs on the same hardware platform as the Web server. CheckPoint Software Technologies, Inc.'s Firewall One can be configured in this manner, although it can also run on a separate machine. (For more on firewalls, check out the Buyer's Guide in last week's issue.)

Where there is a need for both Internet and intranet Web servers, many organizations opt for two servers: a public one on the outside of the firewall and another private server inside.

The trouble is, there are many cases where you need a server with private data and controlled access that also has to be accessible via the Internet. In that case, adding another firewall is the preferred solution. This creates a firebreak — a zone between the two firewalls in which the controlled access server lives, ensuring it is protected but accessible. Even if an intruder manages to break through the outside firewall and into the controlled access server, internal resources remain safe behind the second firewall.

Keeping it private

Still, all of these security features are simply tissue paper over the Internet's most basic gaping wound — the absence of encryption in communications.

Now, unless you are the target of industrial espionage, it is unlikely that anyone is specifically after your data. And if you run a reasonably secure site, the chance of John Q. Random Hacker intercepting any of it is very low.

That said, as a matter of sound systems design, there should be no gaps in your Web security plan. If there is any need at all to secure your data while it traverses wide-area links, your Web server should employ some kind of channel security, meaning a method of encrypted, end-to-end communications.

The leading de facto standards for channel security are CommerceNet's Secure HyperText Transfer Protocol (S-HTTP) and Netscape's Secure Sockets Layer (SSL). Microsoft also has a proposal called Private Communications Technology (PCT), which is similar to SSL but is, as yet, unimplemented in any server or browser.

An important consideration is whether the browsers you expect to access your server support the available channel security protocols. Obviously, this can be set as a standard within a corporate intranet, but it may be a problem for publicly accessible Web servers.

SSL is supported by a number of servers, including those from Netscape, IBM, Microsoft, Open Market, Inc., Process Software Corp. and Spry, Inc. Only IBM's Connection Server/Secure Server and Open Market's Open Market Secure support SSL and S-HTTP.

From the browser viewpoint, SSL support is available in the current releases of Netscape's Navigator, Microsoft's Internet Explorer and the National Center for Supercomputing Applications' Mosaic for Unix. America Online, Inc., Prodigy Services Co., Spry, NetManage, Inc. and NetCom On-Line Communications Services, Inc. all have plans to include SSL support in their services soon. The only browsers that support S-HTTP at the moment are Internet Explorer, Mosaic and Navigator. Spry also has a browser currently in beta test that will support S-HTTP.

From a technical viewpoint, it doesn't matter much which type of channel security you choose, so the broader market support for SSL makes it more appealing. The unknown here is Microsoft's PCT, which, given Microsoft's marketing muscle, could quickly become a market leader. My guess is that over the next year, SSL will become the first choice in the market with PCT a strong second.

Multiple identities

If you use multiple servers with any kind of common content, updating them can become complex, regardless of the type of channel security or firewall you choose and whether your site is public or private. While this can be done manually, a degree of discipline is required to ensure you propagate updates in a timely and accurate fashion.

With operating systems such as Windows NT that offer built-in replication services, it is possible to keep the public data on the internal system replicated to the external server through the firewall. This requires that the firewall be configured to allow communications between the two NT servers. After that, set up the internal NT server to replicate the Web document subdirectories to the external server. Subsequently, when documents are added to the internal subdirectories, they will be replicated to the external server.

If you use Lotus Development Corp.'s Notes, the replication problem can be easily solved with the Lotus InterNotes Web

ONLINE

There's more Web management info available via Network World Fusion:

- ▶ **WebCompare provides an excellent analysis of the feature set of the various Web servers available, as does a recent *Network World* Buyer's Guide on the topic.**
- ▶ **The April 29 Buyer's Guide on application-layer firewalls contains lots of information about securing your Web site.**
- ▶ **Microsoft has the beta release of FrontPage 1.1 available for download. It will stop working on June 30, 1996.**
- ● **BrowserWatch lists a large number of the available Web browsers and their features. Select NetRef, Technology Resources then Internet/Web.**

http: www.nwfusion.com

Voices from the Web management trenches

When it comes to building real Web management solutions, organizations take a variety of paths. But there are few companies for which the issues are more crucial than Internet service providers (ISP).

"Let's be realistic; there's just no common tool for managing all of the different kinds of Web servers that are out there," says Frank Dziuba, president of Silicon Beach, an ISP in Santa Barbara, Calif. "This means that what you need to manage one vendor's server is useless with another's. It's a ridiculous and difficult state of affairs, as many organizations will find they will run a number of different types of Web servers to achieve different goals."

And when it comes to Web content development, Dziuba notes that his staff does most of its editing with plain text editors. "There are no editors that have updates that come to market fast enough to allow us to handle the latest tags and certainly none for the Macintosh, which is the choice of all of our Web development staff."

Acxiom's *Allen remains optimistic.*

At the user end of the spectrum is Acxiom Corp., an information products and services company based in Conway, Ark.

Roseanne Allen of Acxiom's IT group says the company's intranet is becoming central to internal communications. Every team in the organization is developing a Web presence, and new data and services are being made available every day. Acxiom is now rolling out Microsoft's FrontPage internally and plans to make it available to all staff who have information to be published on their intranet.

"Being Webmaster here is more than one person can do," Allen says. "A lot of what we're doing at present is reactive — users notify us of problems."

Allen attributes this to a lack of management tools but sees help on the horizon with the emergence of products such as Interse Corp.'s Market Focus — a tool that helps users determine who is accessing their Web site and why.

"Today, it is a lot easier [to manage our Web server] than it once was," she notes. "With the new crop of Web tools that we're seeing, it will be even easier."

— *Mark Gibbs*

Publisher, a Notes add-on that allows data in a Notes database to be presented via a Web server. Combined with Notes workflow support and replication, you can easily create a publishing system that includes a cycle of editing, revision and content approval by many different people.

Another common requirement is to have one server appear to have multiple IP addresses and service multiple domains. Thus, a server could be www.research.gibbs.com and www.library.gibbs.com at the same time. This feature is called multihoming and requires that the operating system supporting the Web server be able to handle multiple IP addresses. Most Unix flavors and Windows NT can do this, but the next requirement is that the Web server software service multiple domains — a feature that is only just starting to become available.

The list of features that may or may not be implemented for any given product makes Web server selection quite complex. The best fit for a given environment must be determined by establishing functional and management objectives. (For more on this selection process, see our March 25 Web Server Buyer's Guide.)

Management potential

An aspect of Web management that is often overlooked is the Web server management interface. Some of the most sophisticated solutions can be found in commercial products such as Microsoft's IIS, Netscape's various server products, Novell, Inc.'s NetWare Web Server and O'Reilly's WebSite.

Given the diversity of Web server products, it isn't surprising that each vendor has its own management methodology. For example, Novell has a Windows-based configuration application that doesn't work over TCP/IP, while Netscape uses an interface based primarily on Web forms so administration can be performed from a Web browser.

This is an area where you need to conduct a comprehensive needs analysis. Look for how much configuration can be done via a remote or local browser (one running on the server platform), how much can be done with vendor-supplied utilities and how much must be done by editing files (still surprisingly common).

Chopping logs

An area where there is a lot of choice is Web server log analysis tools. As a Web server is accessed by clients, it records requests and responses in a log file. This data is extremely valuable in both load and performance analysis, and also in determining why the site is being accessed — what pages are popular, what pages are not. Unfortunately, most of the available tools simply sort the data and produce nongraphical reports on access frequency by domain, pages retrieved and so on.

One of the more sophisticated tools in this area is Market Focus from Interse Corp. of Sunnyvale, Calif. Market Focus takes log data and uses "several inference-based algorithms to reconstruct the actual visits, users and organizations that interact with the Web site," according to the company.

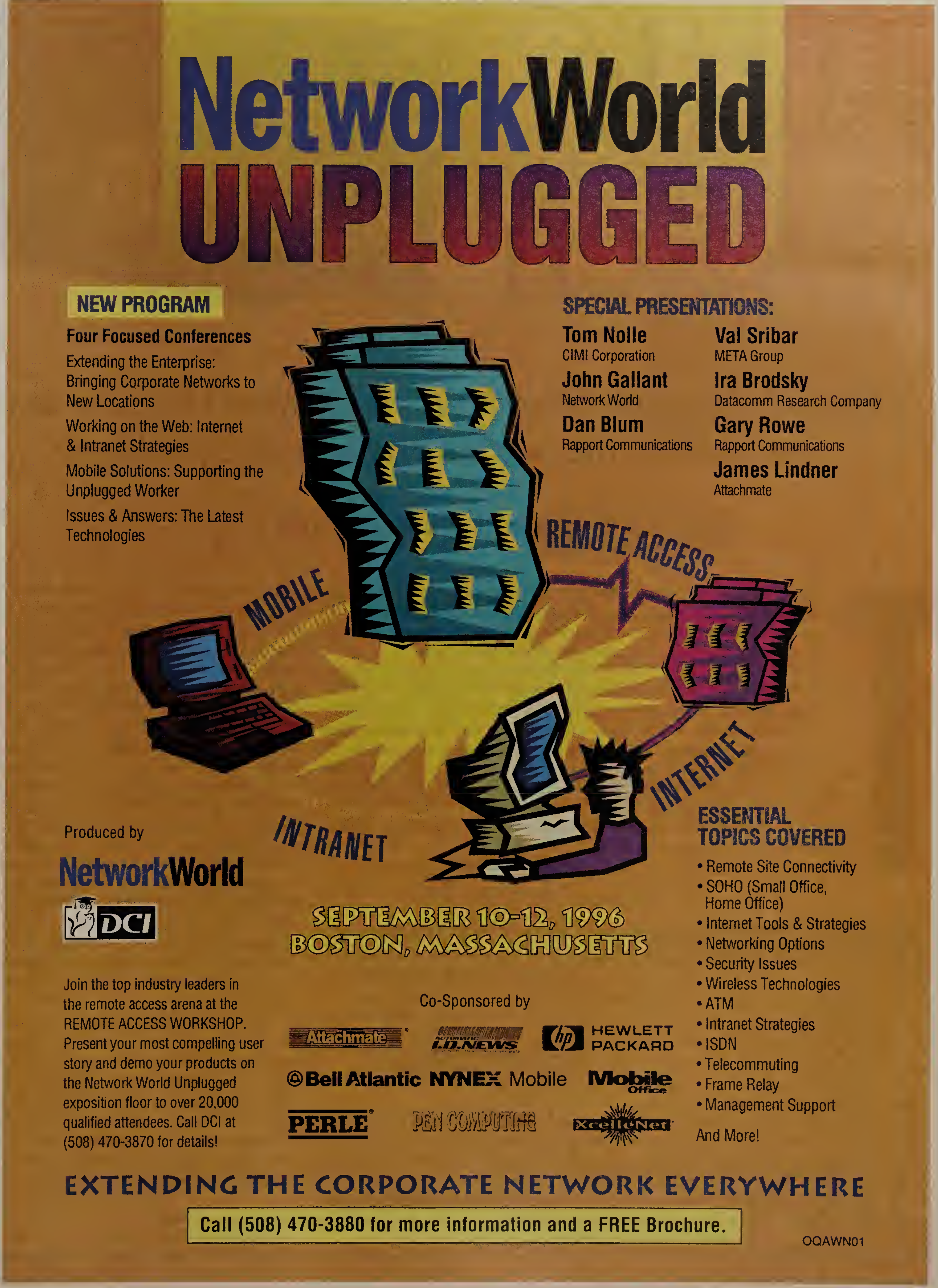
Market Focus is an early entrant into what is bound to become a very competitive arena, so this is a market to watch closely over the next few months. For now, be careful to select a tool that provides only the level of detail you need. Don't choose one that can swamp you in detail if you aren't going to use its facilities.

The bottom line

Web management is a new IT task. While some of the old tools such as SNMP apply, much of the administrative burden and control requirements represent new tasks for which the tool set is rapidly evolving. Expect the cost of Web management to fall rapidly over the next 12 months as better tools and more sophisticated Web server systems appear.

While it may seem that by putting up Web servers you're buying in to trouble, the real costs of publishing information using a Web server are usually considerably less than for groupware and other distributed technologies. Plus, it is a fact that Web servers — like it or not — are here to stay.

Gibbs is a writer and consultant based in Ventura, California. He can be reached at mgibbs@gibbs.com. Thanks to James Domengeaux of ComSpace Internet Services for additional research.



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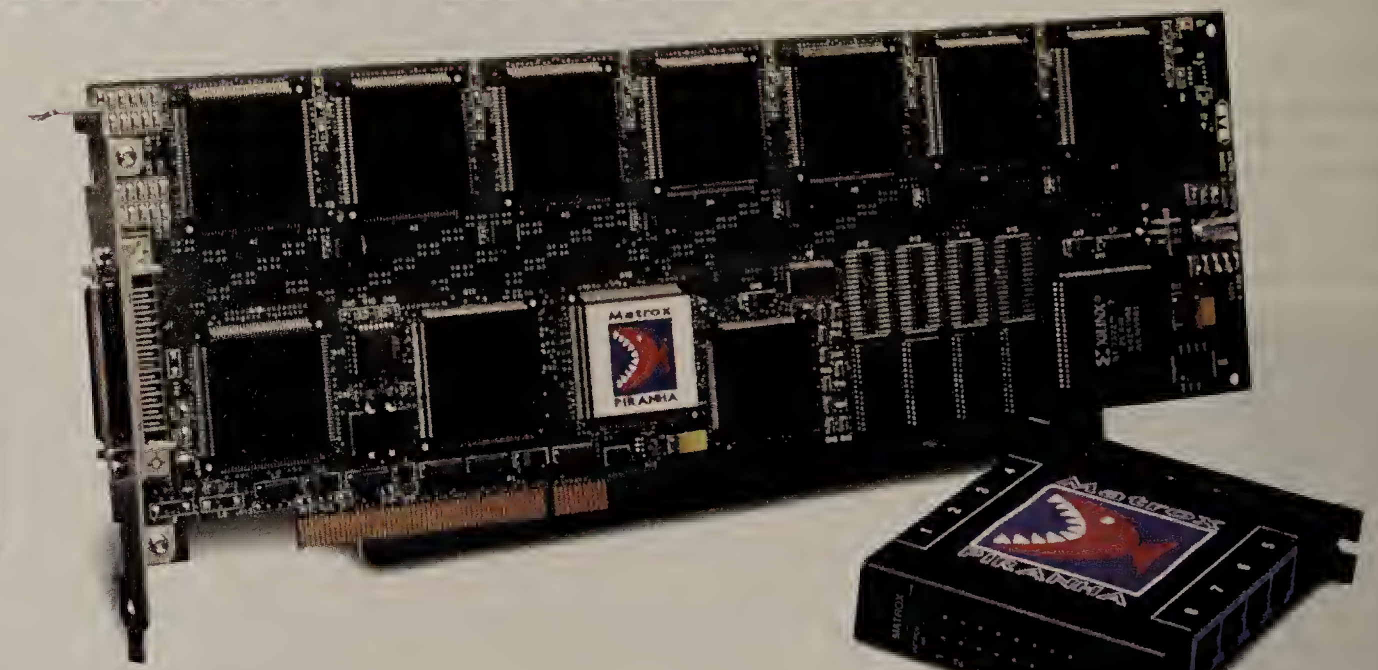
A voracious little switch



Matrox's Piranha SwitchNIC-10/8 lives inside a server and takes a bite out of performance problems.

By Jeffrey N. Fritz

Today, the network interface has be- come a tollbooth for file servers on the LAN highway, creating traffic bottlenecks.

Even a dedicated connection between a server and an Ethernet switch pushes data through a narrow 10M bit/sec pipe. A wider 100M bit/sec link helps, but it's like replacing attendants with an automated toll-taking system.

Matrox Electronic Systems, Ltd. has figured out a way around the bottleneck and demolished the tollbooth. Matrox has developed the Piranha SwitchNIC-10/8 — an Ethernet switch on a PCI card that lives inside a server. With the switch inside the server, Matrox eliminates the hop between the server and the network and gives as many as eight ports direct access to the speedy 1G bit/sec internal PCI bus.

The switch's maximum aggregate bandwidth is 80M bit/sec. Eight ports, each running at 10M bit/sec, allow the switch to be nonblocking, even at Ethernet wire speeds. The Piranha uses buffered store-and-forward technology and cyclic redundancy check (CRC) error checking. Also, it supports a maximum of 16,000 active addresses — enough to accommodate the needs of most networks. As you might expect from any modern network device, it supports Simple Network Management Protocol and Management Information Base II.

The Piranha is most useful in an environment based on Novell, Inc.'s NetWare 4.1 and is heavily client/server. It is particularly useful when there is a high volume of server traffic, enough to create bottlenecks over shared media. Facilities where server traffic is light and sites that already have a large base of Ethernet switches installed will find the switch less valuable.

NetworkWorld Fusion

There's something fishy on Network World Fusion: images of real piranhas. Select NetRef, Buyer's Guides and Reviews, then Piranha switch.

(http://www.nwfusion.com).

In our testing, the Piranha performed impressively, delivering up to 6M bit/sec on each switch port with little impact on server performance.

Among Piranha's attractive features is its price: It lists for $1,320, or about $165 per port.

The product is offered in two configurations: the SwitchNIC-10/8 and the SwitchNIC-10/8+. Matrox sent us the plus version for evaluation. According to Matrox, the plus version has more buffering and better overload characteristics. Both Piranhas require a server with a 33-MHz or faster 486 or Pentium processor, a PCI bus and 4M bytes of RAM.

The Matrox package includes the SwitchNIC card, an RJ-45 bolt-on module, an installation disk and a user's manual. Our switch came bundled with Guardian Manager, a Windows 3.X network management application. Unfortunately, Guardian runs only under Hewlett-Packard Co.'s OpenView for Windows, while the network that we tested on uses Sun Microsystems, Inc.'s SunNet Manager software, so we were not able to test the management software. It would be nice if Matrox offered the management software for a variety of network management platforms.

The switch does provide decent console statistics through a NetWare Loadable Module. The NLM allows you to set learning and aging parameters, enable and disable ports, and reset the card; it also provides port statistics. By directly viewing the console statistics, we were able to track the switch's performance without using the Guardian Manager software.

Assembly required

Installation took us slightly more than an hour and was relatively straightforward. The process involves downing the server, modifying the server's AUTOEXEC.NCF file and installing the switch software. Next, the full-length switch card is inserted into a bus-mastering PCI slot in the server.

NetResults

Product
Piranha SwitchNIC-10/8+

Vendor
Matrox Electronic Systems, Ltd.
(800) 361-4903, (514) 685-2630

Price
$1,195, plus $125 for RJ-45 connector

Pros
- ▲ Inexpensive per-port cost.
- ▲ Simple to operate.
- ▲ Reliable in our production environment.

Cons
- ▼ 10Base-T module hangs awkwardly from server.
- ▼ Hard-to-see status LEDs on module.
- ▼ Requires patches to NetWare.
- ▼ Does not support NetWare 3.11 or 3.12.
- ▼ Supports only HP's OpenView network management package.

Also, installation requires patching the

Novell 4.1 NOS, something that we would have preferred not to do. However, the Matrox-supplied patches seemed to do no harm. The only difficulty we ran into was remembering to connect a 10Base-T reversing cable to the concentrator bank. The Piranha switch functions as a bridge, and when connected to another bridge device such as a concentrator, it must use a reversing cable.

FIGURE 1: PERFORM2 THROUGHPUT

	One client	Two clients		Three clients	
	Average	Average	Aggregate	Average	Aggregate
K byte/sec	**753.18**	**586.62**	**1,173.23**	**432.73**	**1,298.50**
Bit/sec	**6,170,034**	**4,805,558**	**9,611,100**	**3,544,924**	**10,637,279**

FIGURE 2: FILE TRANSFER THROUGHPUT

Type	Transfer time (seconds)	Measured throughput (bit/sec)	Measure efficiency
Workstation to server	**7.4**	**6,274,997**	**63%**
Server to workstation	**7.3**	**6,360,370**	**64%**

We transferred a 5.8M-byte file from the workstation to the server and vice versa, and ran Novell's PERFORM2 utility. Efficiency is percentage of 10M bit/sec bandwidth used by the transfer.

The module contains eight 10Base-T RJ-45 connectors and a series of LED status indicators for each port. One set of LEDs indicates transmit, receive and link status. Another set indicates collisions and full- or half-duplex mode. Since the module mounts on the rear of the server, the LEDs are hard to see.

Matrox's documentation is well written and well organized. The step-by-step instructions are clear, and there are plenty of illustrations. LAN administrators should have no trouble following the installation or operational material in the user's manual. The troubleshooting section, however, is a little sparse for a product of this nature.

Speeding down the highway

Amazingly, the Piranha consumes very few server resources, relying instead on its own onboard processors. The switch's design allows direct memory access transfers to occur between the card and the server's RAM without involving the CPU, making for better performance. In our testing, we detected no obvious slowdown in server performance after the switch was installed.

No network is 100% efficient. Protocol overhead and other factors combine to reduce throughput. To see how well the Piranha performs, we measured file transfer times and used Novell's PERFORM2 utility, which tests performance of the server, client and network devices by conducting a series of timed I/O transfers between the server and clients.

Using both the measured file transfer and the PERFORM2 utility, single-station performance averaged a little more than 6M bit/sec (see Figures 2 and 3, this page). Sixty percent efficiency (6M bit/sec on a 10M bit/sec Ethernet network) is very reasonable performance. As the number of clients increased, the performance of each individual client decreased. However, the PERFORM2 aggregate throughput stayed relatively constant as we increased from two to three clients, indicating that we were seeing a server limitation, not a switch limitation.

To test the Piranha switch's ability to deal with heavy traffic loads, we connected a Network General Corp. Sniffer to one of the ports and bombarded it with packets. At the same time, we ran PERFORM2 tests on the other ports. The Piranha held up impressively. Even with 95% port utilization on the Sniffer port, packets traveled across the other switch ports with only an insignificant number being dropped. With the Sniffer inactive, the average single-station performance was 753K bytes/sec. With the Sniffer running at 95% utilization, the single station performance dropped to 332K bytes/sec. This is not excessive degradation for such heavy traffic.

Since the Sniffer packets were directed to the SwitchNIC and not the server, the degradation was a function of the Piranha having to deal with large numbers of packets, and not due to a server slowdown. However, the Piranha handled the pressure well. It recorded only one CRC error in 50,000 frames at 95% utilization.

One advantage of switches is that they isolate LAN segments, thus offering a degree of network security. To test this, we transferred files to the switch while examining packets on the other ports with the Sniffer. The only traffic that was transmitted to the other ports was the normal Domain Name Server lookups, Address Resolution Protocols, Routing Table Maintenance Protocols and broadcast traffic. None of the packets carrying the file information was seen on the other switch ports. Therefore, the Piranha can be counted on to provide reasonable port isolation and security.

While a lot can be said for the Piranha, the product has a few drawbacks. It lacks some of the advanced options found in Ethernet switches, such as packet filtering and the ability to cascade switches. It also currently runs only in a Novell NetWare 4.1 server.

The best that can be said of an Ethernet switch is that no one notices it. This is very much the case with the Piranha. Although it improved performance, none of the users on our production network noticed that switch was there. It never interfered with user access to the server.

The Piranha performed reliably, with no server crashes attributed to the switch and no outages. In a week of continuous operation on our production network, the card's overall statistics were impressive. Nearly 40 million frames had been received by the switch. There were no collisions, no jabber and only 57 CRC errors. That is fine performance and reliability in anybody's book.

The Matrox Piranha SwitchNIC has a lot going for it. It is inexpensive, reliable and performs well — all in all, an excellent implementation of switching in a network server.

The author thanks Ralph Chapman and Bird Vilseck for their assistance in testing.

The alliance is a co-operative of users, consultants, educators and integrators that applies its technical and business skills to analyze and compare strategic network products. A list of alliance partners can be found on page 39.

Fritz serves as a Telecommunications Engineer for West Virginia University's Telecommunications and Network Services department. He is chair emeritus of the North American ISDN Users' Forum Enterprise Network Data Interconnectivity Family, and author of Remote LAN Access, *published by Prentice-Hall, and* Sensible ISDN Data Applications, *published by West Virginia University Press. He can be reached at jfritz@wvu.edu*

Installation tips

The Piranha's RJ-45 module is connected to the SwitchNIC through a 50-pin connector. We found the module awkward and had to screw it to the card or else it became dislodged. This makes installing and removing the card more difficult and time-consuming. Matrox should use a locking connector to attach the module, similar to the one used on attachment unit interface transceivers.

PCI cards are supposed to be self-configuring, but we were surprised that the installation software required us to assign an IRQ, used for signaling between the PC and a card, to the Piranha. We selected IRQ 9 because it is shareable IRQ frequently self-assigned by PCI cards.

The power requirements for the Piranha are hefty. The switch requires the PC to deliver 22.5 watts on average and peaks as high as 25 watts. The documentation includes a warning to check the PC power capabilities. You'd be wise to heed that warning.

—Jeffrey N. Fritz

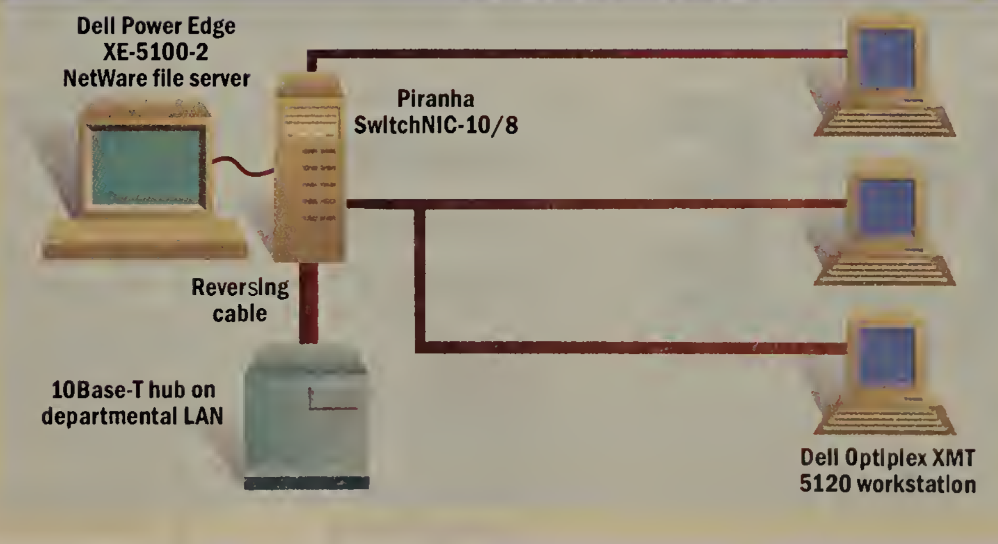
HOW WE DID IT

We installed the Piranha SwitchNIC-10/8+ in a Dell Computer Corp. PowerEdge XE-5100-2, a 120-MHz Pentium server equipped with 64M bytes of RAM, a 6G-byte SCSI RAID array and a Hewlett-Packard Co. 6000E SCSI DAT drive.

We attached three identical Dell Optiplex XMT 5120 120-MHz Pentium workstations to the Piranha. We also connected the switch to a departmental LAN via an Allied Telesyn International Corp. concentrator. This allowed the switch to be tested both as a stand-alone server and as part of a production network (see graphic).

We used several tests to assess performance. We transferred a 5.8M-byte DB2 binary data file between the server and a Dell workstation, allowing us to measure the raw performance of the switch. Throughput was measured with the Novell performance utility PERFORM2, which allowed us to load the server with multiple clients and test throughput under varying loads. It should be noted that PERFORM2 stresses much more than the Piranha card. It also tests the server's and clients' overall performance. We ran PERFORM2 with a varying number of clients. Since all the workstations were the same, there were no performance variations due to slower machines.

Piranha test configuration



Message queue

Continued on page 39

Austin semiconductor facilities was meant to avoid repetition, not to imply that the story represented the entire company's network policy. The story has an Austin dateline, the executive was identified as representing three company sites in Austin and the graphic accompanying the story clearly identifies the Austin facilities.

We appreciate Motorola's efforts to clarify the evolution of its network strategy.

Go for brokers

In his editorial "Paying for vanity" (April 1, page 64), David Rohde asserts that number brokers should be kept out of the auctions, then wonders how the Federal Communications Commission will manage to simultaneously auction 375,000 numbers. The answer: brokers.

The solution to such a large sale is standard prices, not an auction. We can agree that most numbers are worth only a nominal amount and don't merit an auction. But if we let the FCC decide which numbers fall into that category, we will not get the optimum results.

I suggest that the number space be divided into fairly large packages and auctioned, primarily to brokers or interexchange carriers. The purchasers would then form a competitive market, selling most numbers at standard prices and others for whatever the market will bear. Sure, the broker will make a profit, but I doubt the government will realize any less revenue. Most importantly, we will create an efficient market for toll-free numbers.

Once a customer has purchased a number, he or she should also have the right to resell it, again for whatever the market will bear. Go ahead and grandfather the current 800 numbers; potential resale of those numbers will provide useful competition to vendors of the new numbers.

Also, it wouldn't be much of a stretch to go ahead and activate the additional reserved toll-free codes right away. That way, customers would actually have multiple possible sources for the same number. And we wouldn't have to go through the hassle of starting those codes up one at a time over the next 20 years.

Dave Close
Principal consultant
Compata
Costa Mesa, Calif.

Rohde responds: Under the guidelines of the Industry Numbering Committee, carriers and other administrators known as Responsible Organizations must have a specific user in mind for every toll-free number they reserve. Because there already has been too much hoarding of 800 numbers in violation of this rule, the FCC and telephone industry groups are trying to tighten enforcement. Bringing in brokers with no specific use in mind other than number arbitrage would go in the other direction. However, I would have no objection to the FCC hiring contractors to earn a straight fee for administering an auction, rather than earning whatever the market will bear.

Close is correct that the additional toll-free codes — 877, 866, 855 and so on — could and probably should be activated quickly. But that is a marketing issue, not a technical one. Major carriers' efforts to promote even the 888 code have been incredibly feeble, and until the number logjam is broken by an effective rationing system, almost everyone will be loath to promote anything other the 800 code so well known by the public.

Turn it down

Mark Gibbs' column on NetWorld+Interop 96 (April 8, page 66) hit home. Gibbs is right about the noise generated in the mistaken belief that louder is a better sales technique. When I worked in a trade show booth, I found it nearly impossible to be heard over the din of neighboring music and entertainment acts.

I would like to suggest that *Network World* initiate an "inconsiderate neighbor" list for the continuous offenders at any of the trade shows. Perhaps it could lead to a ruling by show managers to regulate or ban this annoyance altogether.

Larry Kowitt
Account executive
Hughes Network Systems, Inc.
Edison, N.J.

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Briefs

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ExecuTrain: (800) 843-6984.

■ **Positive Support Review, Inc. (PSR)** *recently released electronic versions of its* **IS, Communication and Data Processing Metrics Handi-Guide** *for Windows NT and Windows 95.*

Both versions support OLE. They also include tools to implement and monitor service-level agreements and control outsourcing, as well as metrics to evaluate financial, staff and computer systems operations.

PSR: (310) 453-6100, Ext. 101.

■ **Learning Tree International** *has added* **Internetworking: Bridges and Routers** *to its line of multimedia computer-based training (CBT) products.*

The program is designed to teach the concepts behind bridging and routing, the differences between Ethernet and token-ring bridging, how to use IP and IPX addressing, how to integrate routers into a LAN and WAN, and how to assess when to use a bridge, router or switch.

A full multimedia version of the program is available on CD-ROM and a text/graphics version is available on a 3 1/2-inch diskette.

The program is the firm's most recent CBT release. Programs covering client/server systems, the Internet and NetWare are in development.

Learning Tree: (800) 843-8733.

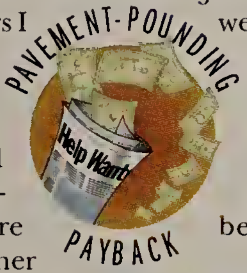
Dive in, the job market's great

By Frank Schoff

"How's the job market?" is a question I am asked a lot today. The answer, in a word, is "great."

My recruiting business is strong, as evidenced by an increase in the number of positions I am being asked to help fill. Other recruiters I work with are experiencing the same uptick in work.

Why this upswing and what can you do to benefit from it? Here are answers to these and other questions.



What is driving this strong market?

Major corporations continue to value networking and telecommunications technologies as tools to improve productivity. This has created demand at all levels for individuals skilled in the latest technologies. What's more, business is good and profits are up, meaning companies are not shy about adding new bodies to reduce the burden on current staff.

What skills are in demand?

Based on the positions I am being asked to fill, the highest demand is for people who can design, deploy and operate multiprotocol, router-based internetworks. People with skills in call processing technologies such as automatic call distributors, interactive voice response and computer-telephone integration are in demand, as well as those with experience in international networking.

Interestingly, the thousands of workers who lost their jobs over the last few years due to consolidations or downsizing have not hurt the overall job market. In fact, those with skills in high demand are being absorbed back into the workforce.

What skills are not in demand?

Plain vanilla voice skills, such as those required to maintain private branch exchanges or oversee public network-based offerings such as a software-defined network, are not in demand. Surprisingly, people with good yet dated cost-reduction skills are finding it harder to land a new job. A resume that reflects the savings of millions of dollars in the late 1980s is of little value today unless it also contains current technical and managerial skills.

Where are the jobs geographically?

Job demand seems to be well balanced throughout the U.S. The only caveat is that competition for work is greater in cities, such as Denver and Atlanta, that are becoming trendy.

What's happening to salaries?

Salaries for jobs requiring skills in high-demand technologies have improved greatly. In fact, some might argue that they have increased too much and too fast, creating a bidding war. It's very possible that the upward pressure on salaries is being driven by third-party service providers, such as contract firms and outsourcing companies. The salaries these firms are willing to pay are determined more by what they can charge for their service than by salary surveys or an individual's previous compensation.

If profit margins are high, for instance, the third-party providers can afford to pay more for their raw materials, which in this case is skilled networking staff.

On the downside, salaries for jobs requiring skills in low-demand technologies have moved forward slowly or held constant.

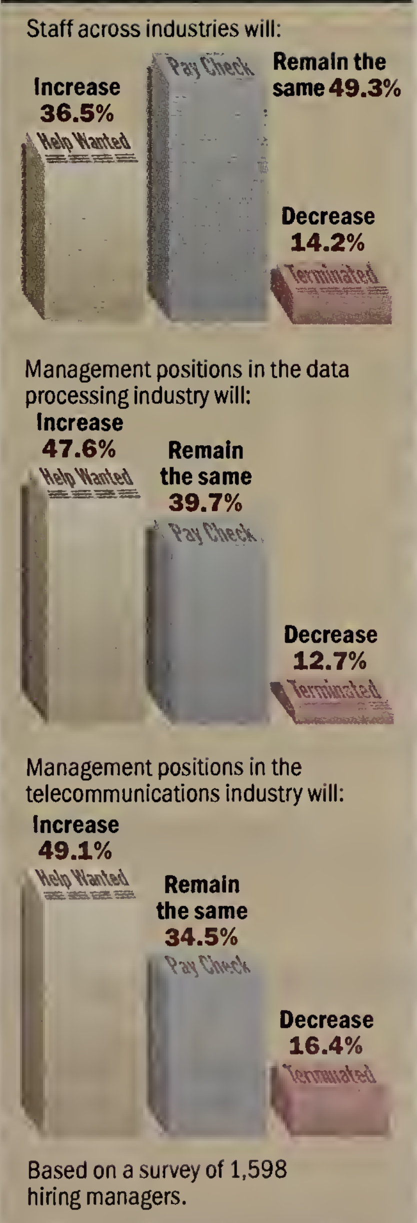
What do you recommend as some near-term strategies?

This is an excellent time to look at new opportunities. It is very possible you can increase your pay and open the doors to additional professional growth. If you prefer not to change companies, you may be able to capitalize on the increased market value of your skills by having an open and frank discussion with your boss.

It is in your employer's best interest to keep salaries competitive, and you may be doing your employer a favor by surfacing the issue before it becomes a problem.

Schoff is president of Management Recruiters in Cedar Mountain, N.C. and specializes in the placement of networking professionals. He can be reached at (704) 884-4118 or by fax at (704) 884-3512.

Hiring plans for first half of 1996



Based on a survey of 1,598 hiring managers.

SOURCE: MANAGEMENT RECRUITERS INTERNATIONAL, INC., CLEVELAND

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Gartner gobbles up training firms

By Kathy Scott

Gartner Group, Inc. is planting itself in the expanding education and training industry with a flurry of acquisitions and a partnership.

The consulting firm has brought education software maker J3 Learning Corp. under its umbrella and has announced plans to purchase Mindware Training Technologies, Ltd., a technology-based development firm in Ireland.

Gartner also intends to buy the remaining 42% of Relational Courseware, Inc., a computer-based training (CBT) company in which Gartner already has a 58% stake. Lastly, the firm announced a marketing partnership with Sylvan Prometrics, the testing division of Sylvan Learning Systems, Inc.

J3 Learning offers training programs for desktop applications, operating systems, relational databases, networking and developer languages. Mindware targets the telecommunications, network and technology management areas. Relational Courseware enhances J3 Learning's titles in a computer-based format. And J3 Learning and Sylvan Prometrics together will offer integrated technology-based training and certification testing for corporate IT departments.

Gartner deserves credit for filling out its knowledge transfer, education and training services portfolio, says Tim Bourgeois, senior analyst with International Data Corp. (IDC), a Framingham, Mass.-based research firm. Bourgeois says the moves build on Gartner's recent acquisition of Dataquest, Inc., an IT market research firm, as well as purchases of a benchmarking company and other IT consulting and research firms.

From the looks of it, Gartner intends to position itself to capture a share of the outsourced training market that a recent IDC report predicts will grow rapidly. The report says more companies favor outside training firms to internal training departments (*NW*, April 8, page 51).

Gartner will eventually combine its training organizations under the J3 Learning brand name and will offer more than 80 multimedia, 108 CBT and more than 140 video training programs.

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- LAN Routing Protocol development (IP/IPX routing, NETBIOS)
- LAN/WAN Internetworking (Frame Relay, X.25, routing protocols, SLIP/PPP, TELNET)
- Diagnostics software development
- Legacy Protocol development (HDLC, SNA Bisync, Async)
- Software Testing (writing test plans, developing stubs and drivers, implementing tests)
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Various positions exist for architects, team leaders, and group managers with a minimum of five years' design experience in a large routed/switched environment. Background with Cisco and Bay Network routers, Ethernet/FDDI switching, and ATM equipment required. Routing experience using BGP and OSPF, multiple AS, and large-scale firewall design required. Experience with large Internet backbones (DS-3+), including multiple-peering arrangements (NAP), highly desirable. Topology modeling using tools such as OpenView, Spectrum, NetSys desirable. Debugging skills at all levels of the TCP/IP protocol family are a requirement. In-depth ATM experience (PNNI, AAL5, LANE) highly desirable.

NETWORK ENGINEERING

Multiple positions exist for network engineers, network analysts, performance analysts, protocol engineers, security engineers, team leaders, and group managers. Requirements include five to ten years' experience with design, installation, and debugging of large routed and switched networks; high-level design/architecture experience; and protocol and hardware-level debugging. Knowledge of network hardware such as Cisco and Bay Network routers, DEC Gigaswitch (FDDI/ATM), Fore ATM switches, highly desirable. Experience with CAT-5, multi- and single-mode fiber, cable management and distribution systems required. Wide-area network candidates should additionally have expertise in leased line technologies (DSO, FT1, T1, DS3, OC-3, OC-12) as well as telco premise equipment. Debugging skills at all levels of Ethernet, FDDI, and TCP/IP protocol family are a requirement.

NETWORK SOFTWARE ENGINEERING

Multiple positions exist for software engineers with in-depth experience with routing protocols, especially BGP and OSPF. Experience with C/C++, SNMP2, and network software such as OpenView, Spectrum, CiscoWorks, Optivity, NetSys, StatsWise, and Cornerstone required. Experience with BSD sockets and System V Streams required. Experience with shell (Bourne or C), Perl, tcl/tk, a plus. Knowledge of the TCP/IP protocol family is a requirement; prior ATM programming in a mixed switched/routed environment (AAL5, LANE) highly desirable. In-depth knowledge of WWW servers, HTML (with Netscape extensions), cgi-bin scripts, and JAVA required. Experience with DNS, NTP, BOOTP, and Lotus Notes desirable.

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These positions involve utilizing tools on Stratus/Tandem and HP and require interaction with vendors and developers. Requires 2-3 years' experience in an NOC environment and at least 2 years' post-high school education. A BS/CS is preferred, as is Unix experience. (Dept. DB-105)

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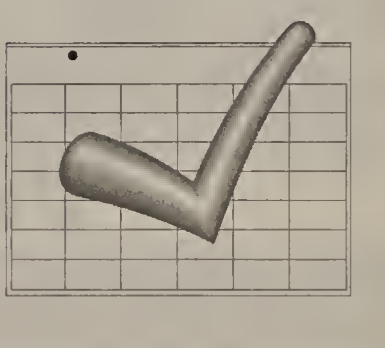

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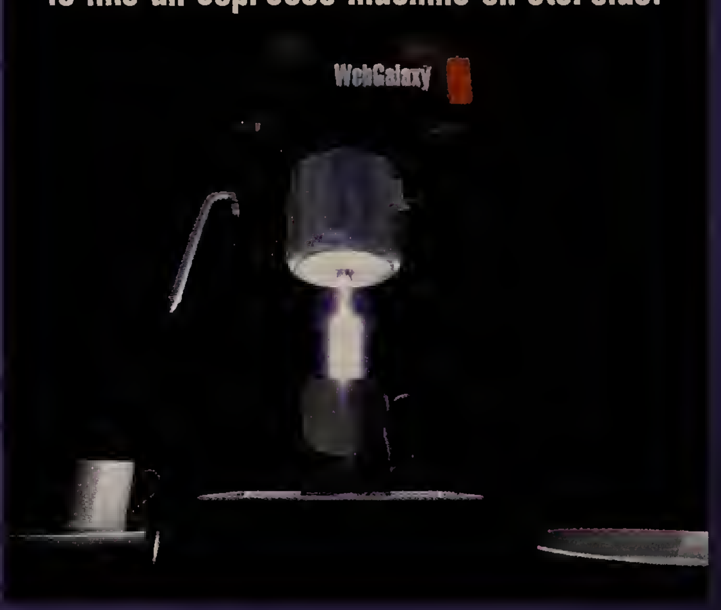

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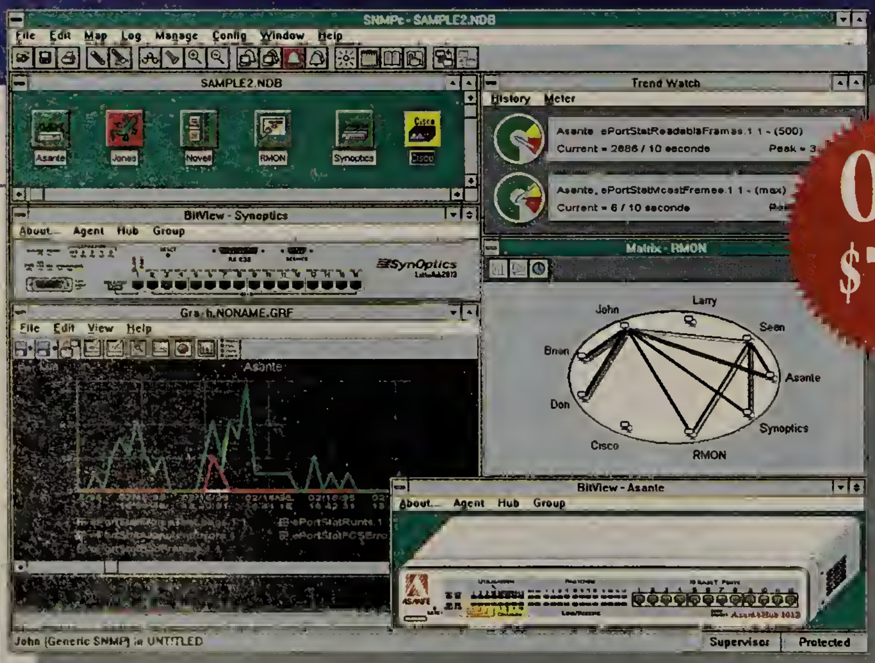

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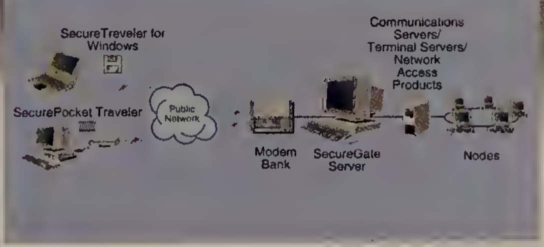
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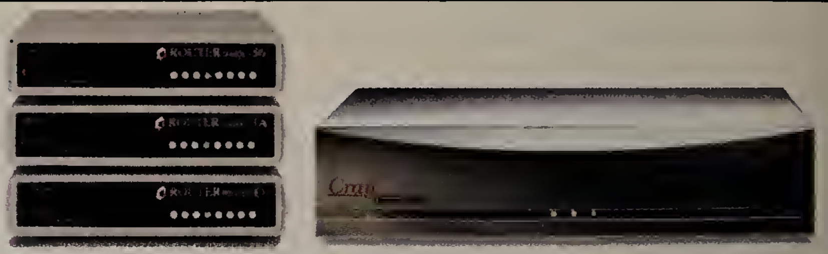

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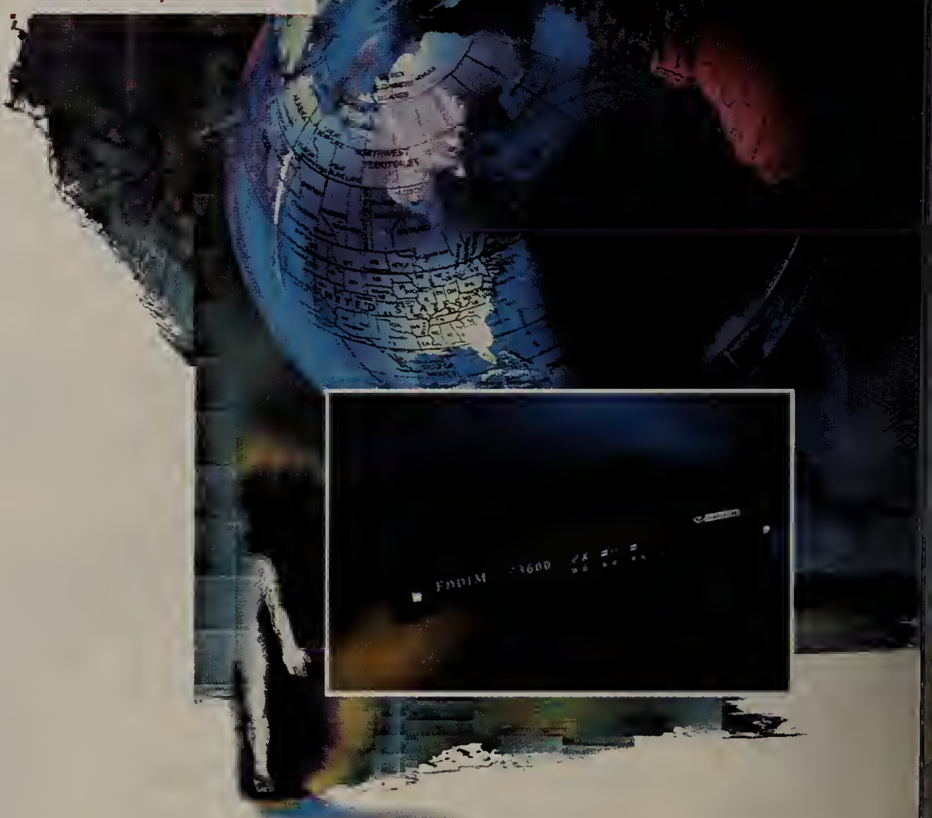

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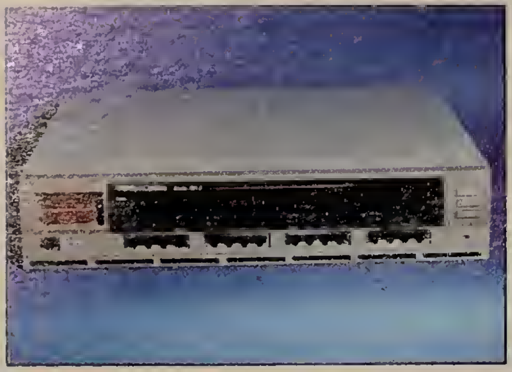

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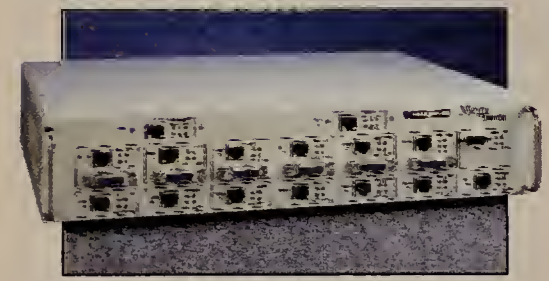

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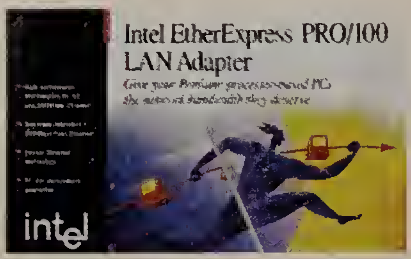

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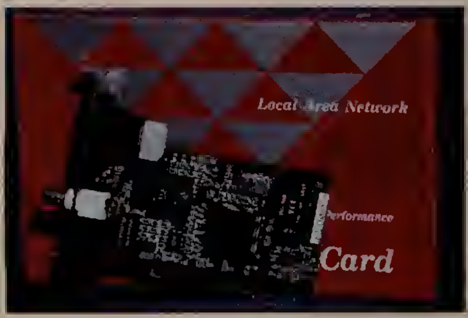

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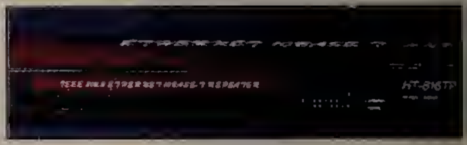

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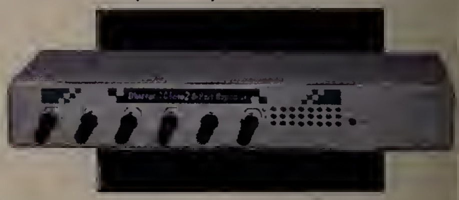

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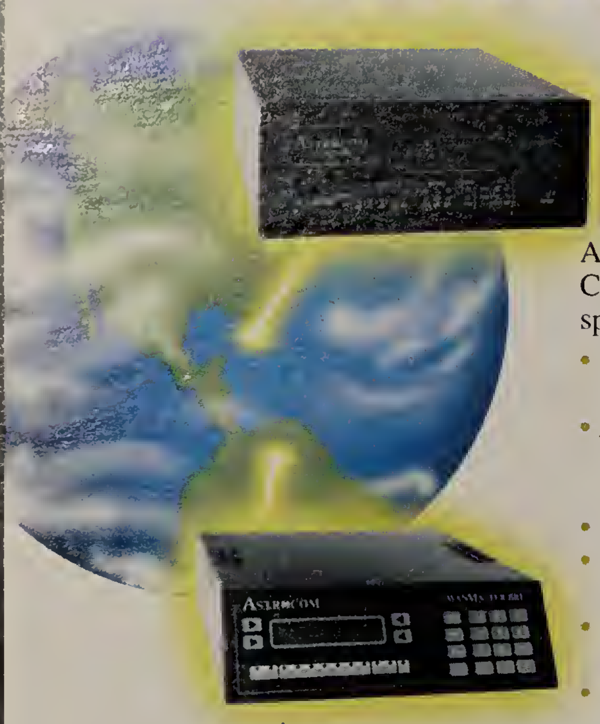

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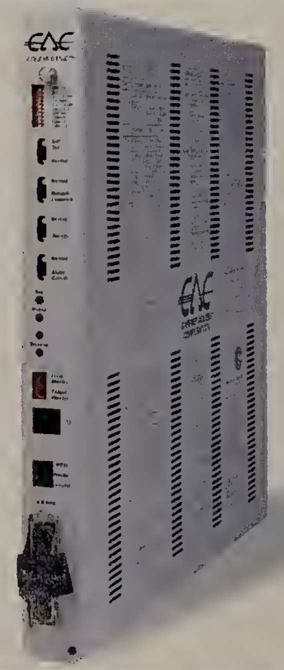

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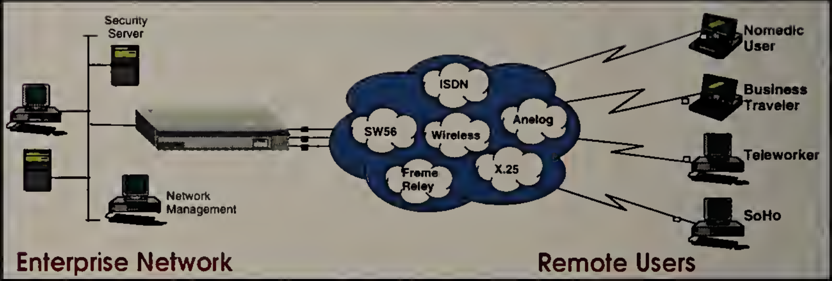

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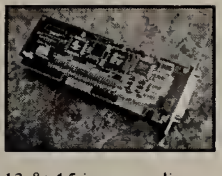

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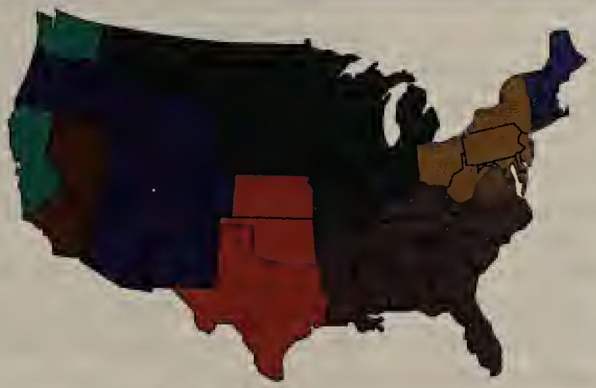

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Hacker

Continued from page 1

less seafarers. They wield their technological expertise ruthlessly — breaking into corporate networks to steal classified documents and vandalize files, harassing perceived enemies and random victims via computer and phone lines — and then brag about their exploits to other self-proclaimed "elites" on hacker Internet Relay Chat (IRC) channels.

That such behavior sounds juvenile is no surprise since "most true hackers are in their teens or early 20s," according to Susan Lloyd, a spokeswoman for the Federal Bureau of Investigation's National Computer Crime Squad office in Washington, D.C.

Lloyd says the FBI may be close to making an arrest in the u4ea case (see story, this page).

That would be a relief to some of the hacker's alleged victims, who paint a picture of a bragging, egomaniacal racist and anti-Semite — characterizations that are vigorously denied in online postings by u4ea and some of his supporters.

Netta Gilboa figures u4ea is anywhere from 23 to 26 years old. And while she doesn't know who he is, the publisher of *Gray Areas* magazine says she knows what u4ea is.

"Basically, he's a malicious little punk," Gilboa says.

Gilboa alleges that she and her Philadelphia-based publication, which focuses on illegal, immoral and controversial issues in modern society, have been the target of a harassment campaign by u4ea since she met him about three years ago on the IRC channel #hack while researching a story.

"His MO is to befriend people online, get information from them and then harass them," according to Gilboa. "He's into getting a reaction from his victims and making his victims uncomfortable."

After Gilboa rebuffed subsequent efforts by him to befriend her, she says u4ea turned on her.

Can you be hacked?
Join our panel of network security consultants as they discuss hackers and system security in an online conference starting today on Network World Fusion.
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WINN SCHWARTAU
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According to Gilboa, u4ea in subsequent months:

- ■ Posted messages on hacker sites alleging that Gilboa was "a narc."
- ■ Posted her phone number online as a number to which anyone could charge international calls.
- ■ Electronically distributed fake copies of *Gray Areas.* (A move Gilboa says backfired because she got some subscriptions out of it.)
- ■ Had her electronic mail and phone messages forwarded to a competitor.
- ■ Invaded Gilboa's computer and reprinted in an online 'zine a letter about him she was preparing for law enforcement.
- ■ Tampered with her parents' phone service and her own.
- ■ Sent her death threats.

All told, u4ea has cost Gilboa and her magazine $1 million in damages and lost advertising revenue, she estimates. Gilboa is working with law enforcement authorities, but as long as u4ea's identity remains unknown, solving the case will prove difficult, she says.

"His anonymity is his power," explains Gilboa, who suspects u4ea may be from British Columbia.

Jason Hatch doesn't really care who u4ea is or where he's from. He just wants the hacker to stop hassling him and the ISP for which he works.

"I'm talking to the FBI, but I'd be just as happy if he left me alone," says Hatch, assistant administrator for BerkshireNet, an ISP based in Pittsfield, Mass.

The hacker has been causing trouble for Hatch and BerkshireNet "on and off since November," he says.

After the ISP took down a security measure to offer free service in late February, u4ea allegedly sent 1,000 anti-Semitic messages from BerkshireNet accounts, deleted 250 home directories of the ISP's clients and removed an entire operating system for one BerkshireNet site.

Hatch says u4ea also targeted a BerkshireNet client, using a stolen name and password to break into her Web site and post obscene messages on it.

Taunting the BerkshireNet administrator by phone and E-mail, u4ea gloated about the hacking he had done and warned of future assaults, Hatch says.

"You have yet to see true electronic terrorism. This is a promise," Hatch says u4ea vowed.

He says while it's "not rare to be anonymous . . . there are very few malicious hackers. Most won't do damage to your system."

However, u4ea falls into that troublesome minority, says Hatch, who doubts that the FBI investigation and press reports will drive the hacker underground.

"This guy never lays low," he says.

The *Boston Herald* incurred u4ea's wrath by publishing several news stories about his alleged attack on BerkshireNet, a *Herald* reporter says.

"He threatened to take down the *Herald* [system] and threatened to take down all of Boston," says *Herald* writer Mark Mueller.

In this instance, u4ea's alleged actions did not live up to his hacker hubris; he succeeded only in knocking out one Web site at www.Boston.net, replacing its contents with a rambling attack on the media and claims that Hatch and the *Herald* were liars, Mueller says.

Gilboa says other hackers are fed up with u4ea, who is suspected of breaking into other computer systems across the country.

"If u4ea is ever identified, he would be through because he has made many enemies of other hackers," Gilboa says. "If they find out who he is, he would have trouble even holding a job because most hackers are capable of doing to him what he does to other people."

Vilified though he may be by much of the hacker community, u4ea also has his supporters.

Lynch, the Webmaster for Dissident (www.dissident.com), a site for hackers, has posted denials of the charges Hatch has made against u4ea. "[While in BershireNet], U4EA did NOT damage ANY files, he did NOT erase anything, he did NOTHING HARMFUL," Lynch writes.

"U4EA is NOT a sociopath," he continues. "I've known him for over a year, and he is an intelligent and witty person. Yes, he hacks, but that doesn't make him a sociopath."

Another hacker, who calls himself X, also has posted a defense of u4ea on his a Web site (www.cdc.net/~x) and an attack on media coverage of u4ea's alleged hacking.

In the message he placed on www.Boston.net, u4ea mounts his own defense.

"I am not a white supremicist...I am not a racist...I am not a sociopath...I have no god complex...."

(*Network World* last week asked u4ea through his friend Lynch for an interview to respond to the allegations that have been made against him. We have received no response, but the offer still stands.) ■

Will FBI pressure bum out u4ea?

FBI agents are confident the identity of the elusive hacker known as u4ea soon will be no mystery.

"The NCCS anticipates there will be an apprehension at some point in the not-too-distant future," FBI spokeswoman Susan Lloyd said last week.

Lloyd, a special agent in the Federal Bureau of Investigation's Washington, D.C. field office, called the u4ea probe "a priority" for the National Computer Crime Squad.

"The hacking that he's done [at BerkshireNet] has been enough to raise a great deal of concern because of his expertise," she said.

Still, Lloyd hesitates to accord u4ea superhacker status. "He's not a Kevin Mitnick," she said, referring to the infamous hacker who was last arrested in 1995.

"There probably are a lot of latent u4eas out there," Lloyd said. "The difference is, this hacker has the gall, the determination, to escalate what he's doing.

"I think this is a game to him. He seems to be enjoying the reaction he's been getting," she said.

While some of u4ea's victims believe he is in his mid-20s and operates from Canada, Lloyd said "it's hard to put a definite profile on him until he's arrested. Most of the true hackers are in their teens and early 20s."

The increase in computer-related crimes in the 1990s has prompted the FBI to open NCCS offices in New York and San Francisco in recent months. The Washington office opened in 1992.

Lloyd said she believes all computer break-ins are wrong, but added that hackers who merely snoop around aren't likely to draw the attention of the FBI.

The FBI's NCCS in Washington, D.C. can be reached at (202) 324-9164.

— *Chris Nerney*

Security expert: Companies, not always hackers, to blame

One might expect someone who has been hacked to hold a dim view of hackers.

But security expert Winn Schwartau, who, along with his family, was harassed by some hackers to the extent that he called in the FBI, does not.

"I do not indict the hacking community. I do not indict the underground," he says.

Schwartau stresses that while "there is a component of people [in the hacker community] that are punks, maybe criminals," the vast majority do not use their technical skills maliciously or destructively.

He is less charitable toward phone companies. "If phone companies would take care of business, lock their security and switches properly, a lot of this would go away," he says. "But the phone companies are absolutely clueless, and I really don't believe they care."

Schwartau also maintains that many of the network-related security problems facing companies can be blamed on "corporate apathy and arrogance" because executives either do not believe or refuse to admit their systems are vulnerable.

While any system can be violated, Schwartau says, there are steps you can take to reduce your vulnerability:

- ■ Eliminate passwords.
- ■ Use strong remote identification devices and hard or soft tokens.
- ■ Put in a symmetrical access control device (not a penny-ante packet filter). Administer it and double-check it.
- ■ Use audit trails.
- ■ Have an attacker response policy and enforce it.

— *Chris Nerney*

Crime

Continued from page 1

Federal agents monitor Internet T-1 access sites and intranet trunk lines made available to them under court order to catch targeted criminals.

Charney *says hackers don't think they'll be caught.*

Justice Department officials are using this sniffer software to collect gigabytes of data flowing across the network, then winnowing through it to find the needle in the Internet haystack for evidence that can bring a criminal to trial.

In the process, the government will collect a large amount of data that does not pertain to the case at hand. "In a hacker case, we can't put a ribbon around their building and tell them to get out while we investigate," said Scott Charney, chief of the computer crime unit at the Justice Department.

Federal investigators will be storing data and performing "a postinterception minimization," where agents extract pertinent data and seal the rest up, never to disclose it, Charney explained.

These extraneous messages and files will be kept confidential, Charney said. But if agents come upon a crime that falls outside the scope of their investigation, it will be considered valid evidence to pursue other suspects, too. "If we stumble into a plan to kill the president, we're not going to ignore it," Charney said.

The Federal Bureau of Investigation's first data-tap investigation began late last year to catch an Argentinian suspected of breaking into the Navy's computers through Harvard University (see story, this page).

Charney said there will be more in the future. "Once there's a court order and we're brought into the case, you're an agent for us, we have a certain relationship," he said. "We tell the system administrator, 'You will be our lead investigator.' "

Justice Department agents are allowed to monitor networks without a court order when users are notified through electronic banners on their screens, Charney said. But the Justice Department has decided to seek court orders in any case, he added.

Privacy groups are deeply troubled by the government's new data-tap policy. "It's scary and dangerous, and we haven't been shown by law enforcement they need to do what they're doing," said Shari Steele, attorney for the Electronic Frontier Foundation.

"It's in everyone's interest to catch criminals, but our users are concerned that they don't want their data perused by others," said Franklin Steen, director of Harvard's Faculty of Arts and Sciences network.

The Justice Department believes laws on the books are outdated because they force investigators to get a search warrant in the jurisdiction where the property is to be searched.

But in cyberspace, hackers park incriminating data in various places and federal agents have to go to various states to get warrants to access hosts at various sites, Charney noted. ■

Case in point

Harvard University was recently the undercover site for the Department of Justice's network surveillance of Julio Cesar Ardita, an Argentinian charged with breaking into the Navy's computers via the Internet.

The Justice Department believes Ardita stole passwords from Harvard's Faculty of Arts and Sciences network, among others, using college networks as a jump-off point in the U.S. to break into several government computer facilities over the Internet.

While the Justice Department worked with Harvard on the case, the two did not see eye-to-eye on privacy concerns.

Stephen Heymann, deputy chief of the criminal division in the U.S. attorney's office in Boston, wanted Harvard to put an electronic banner on its intranet telling users they were being monitored. The banner, implying consent, would let law enforcement do the data tap without having to get a court order.

But Harvard balked at this request. "We don't monitor the network, and we respect the privacy of our users," said Franklin Steen, the Harvard network director. So the Justice Department got a 30-day court order, with extensions, and did the data tap to catch Ardita. The court order came with a gag rule to keep anyone from talking about it, which could tip off the suspect.

"Extensive care was taken in this case about privacy concerns," Heymann said. But monitoring an entire trunk line of onflowing data makes it nearly impossible for law enforcement officials to avoid monitoring data unrelated to the targeted suspect, he acknowledged.

— Ellen Messmer

ATM

Continued from page 1

Roseville Networks Division here.

HP will ship by year-end a 155M bit/sec ATM interface module for its AdvanceStack Switch 2000 modular switch. In early 1997, it will add 155M bit/sec ATM stackable devices to sit atop the company's popular AdvanceStack hubs. Both types of ATM uplink products will allow customers to tie Ethernet and 100VG-AnyLAN workgroups into the ATM world.

"By adding ATM elements to the stack, users will be able to take an entire stack of products — independent of what technology base it was — and uplink them into an ATM environment," Clark said.

HP's ATM product line will include a combination of internally developed gear and partners' products, Clark said. Other future products may include multiport ATM workgroup switches. HP already has partnerships with ATM providers Cisco Systems, Inc., Fore Systems, Inc. and Newbridge Networks Corp.

Mixed message

While HP is readying ATM uplinks for connecting its workgroup devices into ATM LAN backbones, the company is simultaneously recommending that customers use 100VG-AnyLAN technology in the campus backbone. Clark said the technology choice should be driven by users' existing infrastructure and application requirements.

For customers that are heavily invested in shared and switched 100M bit/sec links, HP suggests building a backbone around existing 100VG-AnyLAN switches rather than making the transition to ATM.

HP's *Clark*

And like ATM, VG can be used to support multimedia traffic such as video-on-demand training applications, Clark said. It features a demand priority protocol, which allows time-critical multimedia transmissions to be prioritized over regular traffic. Also increasing VG's backbone appeal is a standards effort in the IEEE 802.12 committee to extend VG technology to gigabit speeds (*NW,* Jan. 8, 1995, page 1).

On the other hand, HP said that customers that have not invested much in switching or 100M bit/sec technology may want to link existing workgroups in an ATM campus backbone. Users can then easily integrate this environment with ATM WAN services.

Also, many sophisticated multimedia applications — such as multiuser videoconferencing across a campus or real-time video applications — are on the way. Once these start to populate the desktop, it will be a stronger driver for ATM campus backbones, Clark said.

But one HP user said ATM is not a cost-effective LAN technology right now. "The guys who have more money than brains [on Wall Street] can afford to do high-speed ATM LANs," said Greg Cooper, data communications manager at Watchtower Bible and Tract Society of New York, Inc., a nonprofit organization in Brooklyn. "But I don't see what ATM can do in a business case that I can't do more economically with other technologies like VG."

Pricing for HP's 100VG-AnyLAN switches averages $500 per port — about one-third the cost of the least expensive ATM switches.

However, HP customer Kevin Walsh, network specialist at the University of California in San Diego, sees a specific need for an ATM campus backbone to connect his VG workgroups. "We're exploring having an ATM backbone because we'll be running medical imaging and real-time audio applications, which justify ATM's quality of service and bandwidth capabilities," he said.

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E-mail

Continued from page 8

manage, while standards are set or on the way. On the downside, Internet messaging lacks a directory, cannot provide delivery notifications and does not have a single standard for attaching files to messages. And whether E-mail administrators want to base their networks on Internet messaging products, they are being forced by eager end users to at least support it.

"People have [Simple Mail Transfer Protocol] servers out there in the company that nobody is supposed to know about," said Cindy Allingham, manager of E-mail support at Bank of Montreal in Toronto. "It's our job to make all this stuff work together, so we find out about it," she said.

Allingham supports the move to Internet messaging, especially to support remote workers. "We spend a lot of administrative time supporting users today who have difficulty with remote mail client software," she said.

"Ease of use is not an issue with a browser," said Blane Woodard, manager of technical systems at Northwestern Mutual Life Co., an insurance company in Milwaukee that has about 10,000 users on Hewlett-Packard Co. OpenMail. World-Wide Web browsers will eventually replace E-mail clients as we know them today, he said.

Beyond browser access to mail servers, companies are starting to take a harder look at utilizing Internet protocols as messaging standards.

Bay Networks, Inc. will migrate more than 5,000 users off a SoftArc, Inc. FirstClass client/server messaging system to an SMTP-based messaging system. The new system will be based on public domain mail server software and an as yet undetermined browser or Web mail package as a mail client.

"We are hoping this will be our last E-mail conversion," said Ron Guzek, director of networking systems at Bay. "No matter what happens, our server platform will be the same. The only changes we'll make are on the client side." ■

Should the 'Net be your messaging platform?

Pros
- ▲ Becoming ubiquitous
- ▲ Based on IP
- ▲ Vendor-neutral group – the IETF – develops standards
- ▲ Low-cost clients may be used for various applications

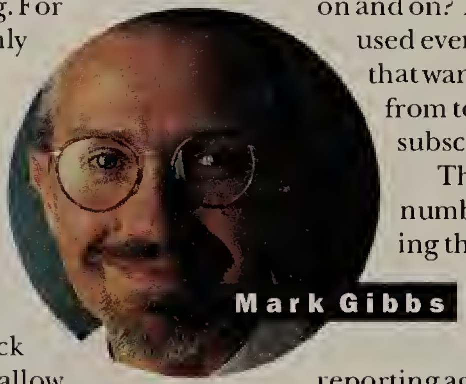
Cons
- ▼ No directory
- ▼ Designed for computers that are always connected
- ▼ No delivery receipts for messages
- ▼ Lack of a standard for sending attachments

The price of freedom (or: More on "How safe do you want to be?")

My April 1 column, "Fighting Crime with IT: How Safe Do You Want to Be?" generated a phenomenal amount of E-mail. If you didn't get a reply from me, it was because my E-mail system bombed big-time and I am so overloaded with E-mail that I can't actually reply to everything personally. (I am trying to get sorted out with an autoresponder so I can at least acknowledge messages.)

In general, the mail could be divided into three camps: those who thought the column was a joke; those who thought I might be a running dog of imperialistic capitalism siding with the satanic forces of the CIA; and those who agreed.

For the first group, which seemed to find the whole thing too wild/outrageous/disturbing to be taken seriously: Sorry, but I wasn't kidding. For the second group: I am only a running dog of capitalism. For the third group: High-fives all around.



Mark Gibbs

Some of the commentors were outraged. One comment that came up a surprising number of times was that using transponders to track vehicle movement might allow the police to automatically issue you tickets for exceeding the speed limit by as little as 1 mph. Yeah, so? Guys, speeding is illegal. Nowhere in the Constitution does it say you shall have the right to tear up the roads. Nowhere did the founding fathers say that 31 mph in a 30-mph zone is OK. But I digress.

Back to my main thrust. Let us be quite clear; I am not suggesting that we give up our rights and privacies with wild abandon and submit to in-depth, pervasive electronic monitoring. And those who found parallels between my suggestions and Nazi Germany are so far out in left field, I am left almost speechless.

If we are to respond effectively to the absolute moral requirement to build a safe society, we must find effective solutions for criminal behavior and employ appropriate tools. My suggestion was that we use information technology as a tool to help make some of the problems more tractable. Comprehensive solutions obviously involve far more than IT.

As for the issue that such information technology ultimately requires giving Big Brother more data to work with, get real. How much privacy do you think you have today? Try not filing your tax return. Just try not telling the division of motor vehicles your date of birth. Just try getting Equifax, Inc. et al to erase your credit history. Good luck.

> *Real freedom has a price, and information technology can give us a discount.*

Do you realize that there are a number of private organizations that can profile you by age, credit history, salary band, marital status, number of children, house value, cars you own, and on, and on and on? This information is used every day by companies that want to sell everything from toothpaste to magazine subscriptions.

The truth is that a huge number of parties, including the government, direct-marketing organizations, supermarkets and credit-reporting agencies, have you analyzed, classified and filed to hell and back. That's the reality of the Western world at the dawn of the 21st century. It is part of what we consider our free society.

But freedom — real freedom to pursue your life in peace and safety, to live a civilized life — has a price. It requires that you accept the authority of the police, the courts and the criminal justice system, to name but a few. As modern society becomes bigger, more complex and more dynamic, so must we redefine what freedom means.

I believe that if we accept the need and apply ourselves to the task, we can find IT tools and techniques that will provide the kind of information that is the foundation of managing the safety of a society as vast and diverse as America, while safeguarding individual freedoms.

Real freedom has a price, and technology can give us a discount.

Do you have an intranet? Would you answer Gibbs' E-mail questionnaire about it? Drop him a note with the subject Intranet Survey at mgibbs@gibbs.com.

Like magic, MFS/UUNET deal changes 'Net service

David Copperfield is world-renowned for his magical illusions. Like every magician, Copperfield's success depends on the skilled use of misdirection. The audience focuses on one thing while the magician deftly does another. People are thrilled by the unanticipated result.

Dave Buerger

While not quite magic, some of the spectacular multibillion-dollar Bell merger agreements are serving up the same effect: distracting people from smaller but more significant events.

Take the April 22 announcement that Bell Atlantic Corp. would merge with NYNEX Corp. The $22 billion deal was a head turner.

The merger represents the second-largest business deal in U.S. history. The new Bell Atlantic company will have more than $27 billion in revenue and $3 billion in earnings. But more important is the opportunity for growth in a heretofore forbidden area: long-distance service.

> *Both parties snubbed their noses at the big guys and created their own unique Internet powerhouse.*

About $35 billion of long-distance calls begin or end in the new Bell Atlantic's region, according to *Business Week.* Once Bell Atlantic persuades the Federal Communications Commission that competition for local services in its region actually exists, long-distance service will become a sitting duck.

No wonder AT&T, MCI Communications Corp. and other long-distance providers are worried.

But the Bell Atlantic/NYNEX merger has simply distracted our attention from another merger that has bigger implications for business users: the MFS Communications Company, Inc. and UUNET Technologies, Inc. $2 billion merger announced last week.

The new company will be unique. For the first time, an Internet service provider (ISP) will offer a full range of Internet, voice, data and video services over a private local and long-distance network.

Business users can only love this setup. One vendor will be able to furnish Internet access and IP expertise — without involving the local phone company. MFS will have international scope with 543 Internet points of presence, half outside the U.S.

People had speculated that UUNET would be acquired by a Baby Bell aiming to break into Internet service. Others guessed MFS would be acquired by a long-distance company to crack the local telephone business. Instead, both snubbed their noses at the big guys and created their own unique Internet powerhouse.

Smooth move. It makes MFS the largest ISP and the only one offering local services in addition to Internet access. This is far more attractive to business users than bumbling telephone companies that talk a good game but have minimal Internet experience.

Users will need this type of leadership as the existing 1,500-odd ISPs begin consolidating this year. Most lack the economies of scale to make money and will be forced to merge with larger players or go out of business.

The Yankee Group predicts the number of ISPs will drop to 600 by year-end and to 100 by 1998. But that doesn't mean the Internet access business will dry up. Yankee predicts ISP revenue will triple to $2.5 billion by the end of 1998.

MFS can't lose. In fact, it stands to gain much more. This is the year of the Internet. Businesses are just beginning to realize that the Internet can save them big money over traditional forms of telecommunication. James Crowe, MFS chairman and CEO, claims that traffic can move "a hundred times cheaper over the Internet."

And once they go mainstream, nontraditional Internet applications, such as voice and facsimile services, are bound to take a huge bite out of traditional telephone service revenue. Internet specialists such as MFS will score big.

It seems improbable now, but eventually — like magic — the industry will learn that Internet firms such as the new MFS are the real long-term force in telecommunications.

Buerger is a networking industry consultant and writer in Atlanta. He can be reached at dave@buerger.com.

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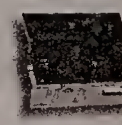

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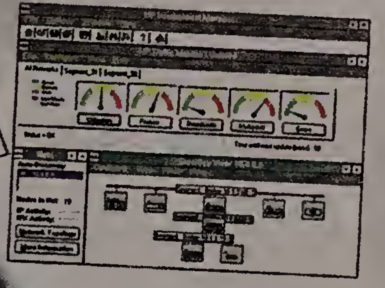

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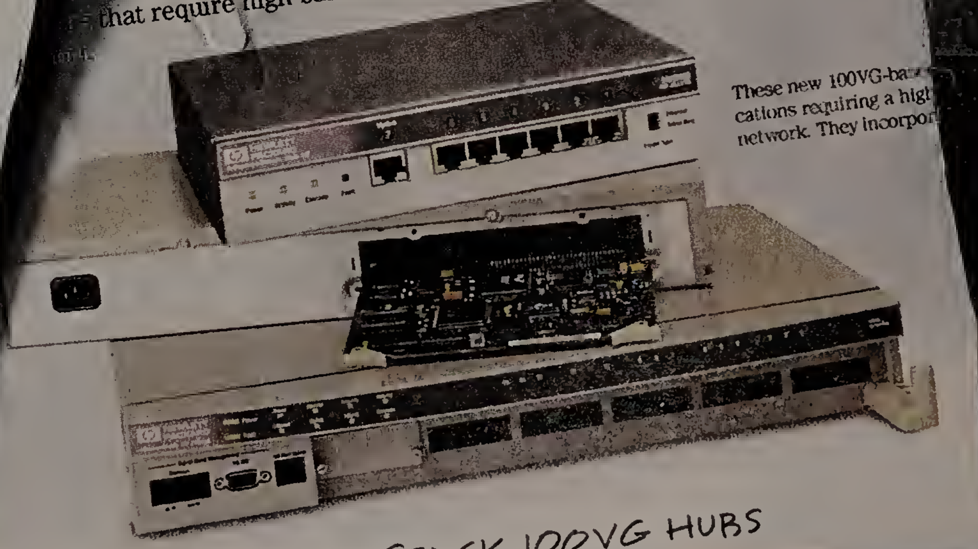

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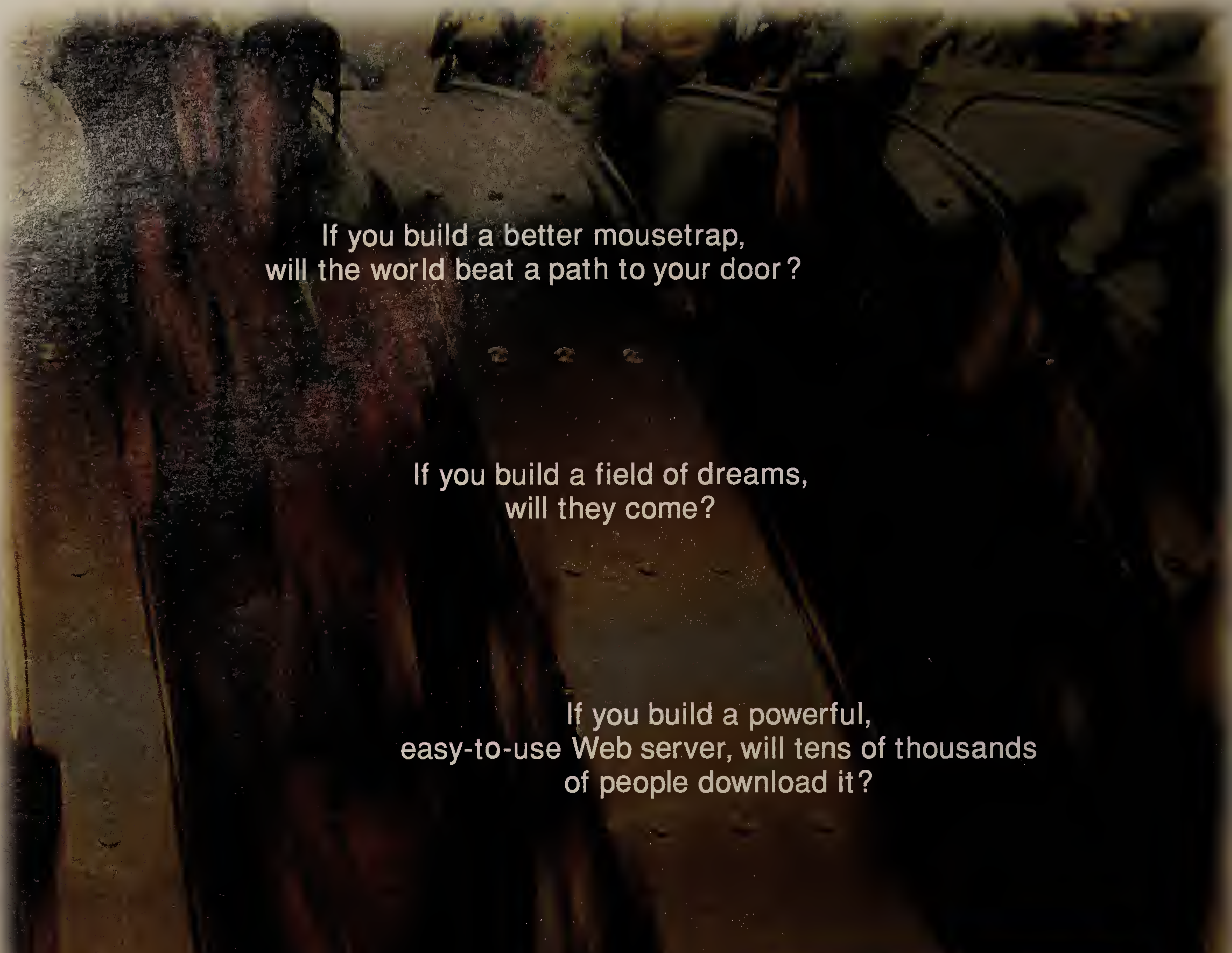

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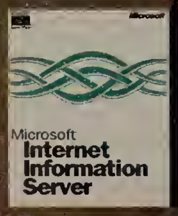

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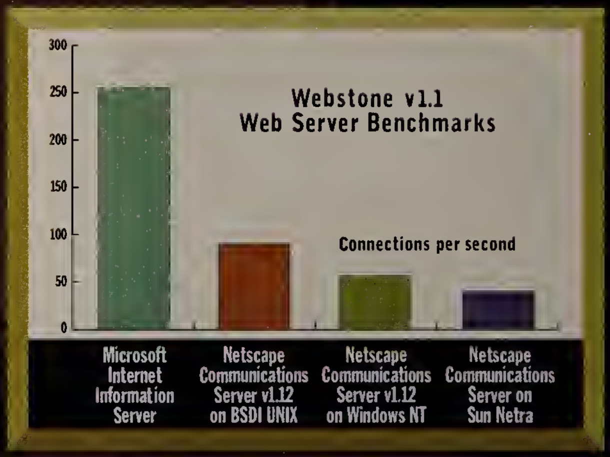

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*As reported by Netcraft. **Webstone tests on IIS, Netscape on Windows NT and Netscape on BSDI UNIX run by Shiloh Consulting during January and February 1996. For details, see http://www.microsoft.com/infoserv/. Webstone tests on Netscape on Sun® Netra run by Hewlett-Packard.® For details, see http://www.hp.com/csopress/96jan29a.html. †Through your reseller, you can get it for about $99. ©1996 Microsoft Corporation. All rights reserved. Microsoft and Windows are registered trademarks and BackOffice, *Where do you want to go today?*, and Windows NT are trademarks of Microsoft Corporation. All other company and product names are trademarks of their respective owners.